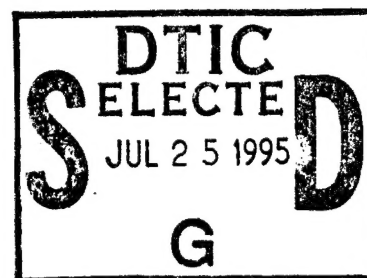


NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS



REORGANIZATION AT THE
NAVAL AIR WARFARE CENTER,
AIRCRAFT DIVISION,
INDIANAPOLIS, INDIANA:
A CASE STUDY

by

Timothy John Green

June, 1994

Advisor:

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Reorganization at the Naval Air Warfare Center,
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A Case Study

by

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Lieutenant, United States Navy
B.G.S., University of Michigan, 1985

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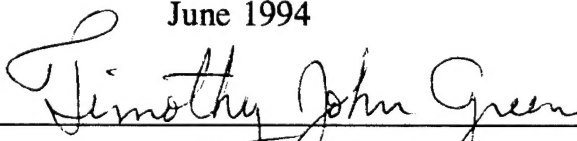
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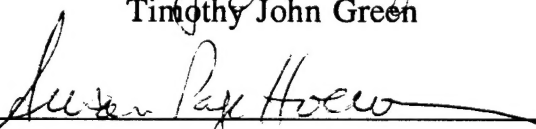
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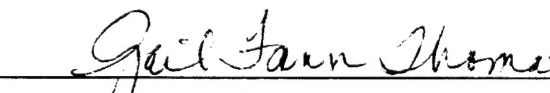
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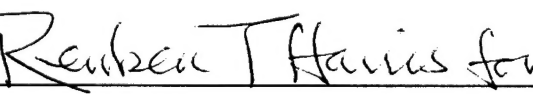
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I. INTRODUCTION

In April of 1992 the Naval Air Warfare Center, Aircraft Division, Indianapolis, Indiana, (NAWC-ADI) underwent a significant reorganization. NAWC-ADI commissioned the Naval Postgraduate School, Monterey, CA (NPS) to conduct interviews with management to document the events, organizational climate, processes and other factors considered relevant to the reorganization effort.

A. RESEARCH OBJECTIVE

The research objective of this thesis is to document and analyze a case study that involved (1) changing NAWC-ADI's managerial structure from hierarchical to a matrix organizational design and (2) making the transition from a bureaucratic to a team-based method of operation. Areas of research considered relevant to these changes are:

- The cultural climate of NAWC-ADI preceding the reorganization.
- Prior managerial events at NAWC-ADI focused upon quality improvement.
- Political and competitive forces relevant to the reorganization.
- The conceptualization and implementation planning phases of the reorganization.
- Dominant themes and dynamics that occurred among individuals involved in the planning and implementation phases of the reorganization.

- Critical methods, processes and objectives used in planning and implementing the reorganization.
- Areas of difficulty in conceptualizing and planning the implementation of the reorganization.

The overall purpose of this thesis, therefore, is to attempt to gain a greater understanding of the historical, contextual, interpersonal and organizational dynamics of organizational change by closely examining the preparations that went into restructuring the working relationships at NAWC-ADI. This greater understanding may be of value in planning similar actions in other organizations.

B. RESEARCH METHOD

Since a major objective of this thesis was to attempt to capture the history of change at NAWC-ADI, qualitative rather than quantitative research methods were determined to be appropriate for this thesis. The case study method was determined to provide the best potential for collecting, organizing and examining the data used in this study. As Yin (1994)" states:

The case study is but one of several ways of doing social science research. ... In general, case studies are the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over the events and when the focus is on a contemporary phenomenon within some real-life context. (p. 1)

While one can most assuredly obtain a basic level of understanding of historical events from facts, figures and a chronological arrangement of reality, history is brought to

life much more vividly with a greater richness of emotion, relevance and personality using qualitative methods. Unfortunately, as Gillette (1985) notes,

Recent organizational behavior literature reflects an emerging concern among social scientists that current scientific methods are failing to capture the dynamic qualities of organizations. (p. 305)

These dynamic qualities of energy and emotion are elusive but valuable in providing a richness of data from which learning can occur.

A dilemma presents itself, therefore, in how to uncover information relevant to learning about organizational change. Inquiry methods for qualitative research into organizational behavior are not clear cut. Various clinical research methods considered to gather these data included archival analysis, interviewing, historical analysis, direct observations, participant observation, and biographical research. Given the circumstances and resources available to conduct this research, the method chosen for this thesis was analysis of retrospective, personal interviews and archival material. Obtaining data from various individuals (both intimately and remotely involved in the reorganization effort) as well as archival documents would be useful in attempting to determine the "most truthful" description of the events that took place. Multiple qualitative data points could then be "triangulated" against each other to determine a common interpretation of events.

It would be naive, however, to assert that this method of inquiry is a precise analytical process. For instance, Kram (1985) discusses the effect of researchers' group memberships upon analysis,

Clearly, in this kind of inductive and 'messy' process, there are many ways to cut the data; and the researcher's perspective on the world, shaped by his or her group memberships, will determine which course is chosen. (p. 254)

Despite this and other possible biases, an attempt was made to shape a history from the experiences and documents of others; to present this mosaic of information in a manner that was both comprehensive, comprehensible and as objective as possible. Simmons (1985) describes it best as

... slowly building an image of the reality out of which each person and group produced documents, took stands, responded to others, and made decisions. (p. 299)

With this perspective and an awareness of its limitations, data were gathered through personal interviews and archival documents.

1. Interviews

Private interviews with 15 senior civilian executives and managers were conducted over a three-day period from January 24, 1994 to January 26, 1994 at the NAWC-ADI facilities in Indianapolis, Indiana. The interviewers were LT Timothy J. Green and Prof. Susan P. Hocevar both from NPS. Of the fifteen subjects interviewed, four were members of the Concept of Operations team and two were members of the Concept of Operations Steering team. The Executive Director and three

members of the Command Staff were also interviewed. The remaining subjects were Competency Center Directors and Directorate Directors.

The interviews were each 45 minutes to two hours in length. The following objectives for the interviews were electronically transmitted to NAWC-ADI prior to the arrival of the interviewers:

Very few things have been written about the decisions, troubles, excitement, and struggles that people undergo during major organizational changes. We want to discover the unique people, events and qualities of NAWC that made this change possible. By writing down the history of how NAWC decided to undergo its major changes, and telling about what it has been like for you, we hope other organizations, going through similar changes, can benefit from the lessons you have learned. For that reason, we have asked to meet with the certain persons involved in the very early stages of planning your changes to hear stories about how new ideas were proposed, who proposed that these changes occur, how people responded, how NAWC became concerned with quality.

It appeared, however, that a miscommunication occurred as to the intended recipients of the objectives; most of the interviewees stated they had not received the written interview objectives concerning the purpose of the interviews. Despite their lack of written information, the interview subjects expressed a general awareness of the reasons we had requested interviews, as the purpose of our visit was communicated to them by other means prior to our arrival.

The interviews opened with the interviewer reading a statement (Appendix A) to the subjects prior to questioning to provide the purpose of the interview, define the intended

areas of discussion, and express the desire to record the interview for transcription purposes (to which there were no objections). A few interviews were monitored by LT Joseph A. Bauknecht to obtain supplementary information for thesis work regarding Quality of Worklife concerns at NAWC-ADI. It did not appear that his presence nor the tape-recording of the session adversely affected the openness or candidness of the subjects being interviewed.

To facilitate frank and candid discussion, interview subjects were informed of the intention to keep the personal identities anonymous, although their aggregate remarks would be the data upon which this thesis would be based. To fulfill this promise of confidentiality, quotations from interview subjects used in this thesis will be attributed categorically, (i.e., Concept of Operations team member, Steering team member, etc.) rather than specifically by name. For similar reasons, the interview audiotapes and transcriptions are not included as part of this report.

The interview questions served as a guide to areas of questioning but were intentionally designed to permit exploration of topics that emerged as interviews progressed. During each semi-structured interview, subjects were asked about their recollections of the origins of change at the Center. They were allowed to identify where their sense of movement toward the new organization began to accelerate and if and how they were involved in the reorganization planning

process. If they were involved, questions about how they became involved and what their understanding of their mission was. If not involved, they were asked about their perceptions and others they worked with concerning what was occurring. They were asked to identify critical incidents, successes and challenges they encountered and to discuss how they felt about these things and the outcomes of what they underwent. Then they were asked to evaluate the reorganization effort and comment on areas that continue to pose difficulties for them and areas which they felt worked very well. (The list of possible guideline questions is included in Appendix A)

Intertwined with the interview method of collecting data was the analysis of the data. After each of three days of interviews the interviewers met to discuss them and identify areas of inquiry for which additional data were desired. Attempts were then made to focus subsequent interviews on these areas.

While most methods of analysis seek to verify theory, the task of this research was to develop theory. Glaser and Strauss (1967) present two general approaches to the analysis of qualitative data.

1. If the analyst wishes to convert qualitative data into crudely quantifiable form so that he [or she] can provisionally test a hypothesis, he [sic] codes the data first and then analyzes it. He makes an effort to code "all relevant data that can be brought to bear on a point" and then systematically assembles, assesses and analyzes these data in a fashion that will "constitute proof for a given proposition." (Becker & Geer, 1960, pp.279-289)

2. If the analyst wishes only to generate theoretical ideas--new categories and their properties, hypotheses and interrelated hypotheses--he cannot be confined to the practice of coding first and then analyzing the data since, in generating theory, he is constantly redesigning and reintegrating his theoretical notions as he reviews the material. Analysis after the coding would not only delay and interfere with his purpose, but the explicit coding itself often seems an unnecessary task. (p. 101)

The first approach seems most applicable to verifying theory whereas the second seems particularly relevant to developing theory. The focus of this research was the latter; to generate ideas, themes and theories about organizational changes and their effect upon the individuals involved in the changes.

Kram (1985) provides further insight into the dynamics of the simultaneous collection and analysis of interview data such as that obtained in this research:

In practice, the analysis of interview data cannot entirely be separated from the collection of the data. In clinical research of this kind, these two phases of the research process are intimately entwined. As interviews are conducted, initial insights emerge about the phenomenon that is being studied. These new insights influence the kind of questions that seem important in subsequent interviews. This inductive process is characterized by continuous movement between data and concepts until the time when sufficient categories have been defined to explain what has been observed. (p. 254)

This method of analysis in many ways contradicts the traditional scientific method of narrowing the possibilities toward the most likely answer. Rather, "It consciously seeks to widen the field of possible answers. This increases both the uncertainty any researcher has concerning the ability to

understand a complex system and the volume of data that needs to be examined." (Gillette, 1985, p. 318).

2. Documents

Another source of research for this thesis was organization documents. These included manuals, newsletters, meeting minutes, training materials, organizational charts, personal notes, pamphlets, overhead projector slides prepared for command presentations as well as three separate attempts by anonymous Center employees to document the history of the reorganization at NAWC-ADI and a compendium of lessons learned. Appendix B provides a listing of organizational documents used. By examining the thoughts of these writers and looking beyond the experiences of any single individual (whether they be an interviewee or a archival writer) a richness of data can be drawn together to form a narrative that attempts to make sense of the behavior of the individuals involved and the events in which they were involved. That narrative is provided in the following background and reorganization sections.

II. BACKGROUND

A. A VISION OF CHANGE FOR NAWC-ADI . . . Building a Tin Cup

*I want those guys **not** to treat it like a crystal bowl. Treat it like an old nasty tin cup ... you can hammer on it. It's not some fragile thing where you just barely have to just touch it around the edges and tip it a little bit to make it work better ... you can really do something with it. ... bang it...drop it on the floor or whatever.... **Look at it and see how it works.***

This statement from a senior executive instrumental in leading the reorganization effort at the Center has come to describe the essential focus of the newly organized employees at NAWC-ADI. It conveys the sense of malleability they strive to achieve; a built in ability to transform and recast depending upon changes in their operating environment. But before this new organization can be examined, it is necessary to look at the forces that reshaped this organization.

B. ORGANIZATIONAL HISTORY

The Naval Air Warfare Center, Indianapolis (NAWC-ADI) was commissioned May 22, 1942 as the Naval Ordnance Plant, Indianapolis under the Naval Bureau of Ordnance. It was accepted from the Lukas-Harold Corporation and then turned back over to them for World War II production of the Norden bombsight and related fire control equipment. In September of 1945, Lukas-Harold was released from its wartime contract, its

employees were converted to Civil Service and work emphasis shifted to shipboard and airborne fire control devices.

In July of 1956, the plant was renamed Naval Avionics Facility, Indianapolis (NAFI) when control of it shifted to the Bureau of Aeronautics. Three years later, the Bureau of Aeronautics merged with the Bureau of Ordnance, and control of NAFI shifted to the resulting Bureau of Naval Weapons (BUWEPS). When BUWEPS reorganized into systems commands in 1966, NAFI was named a field activity of the Naval Air Systems Command.

Through these transitions, the Center has evolved from a manufacturing facility capable of producing hundreds of a limited line of mechanical devices each month, to a command with greatly enhanced engineering development, material acquisition, and logistics support capabilities. In December of 1977, these changes led to NAFI being renamed the Naval Avionics Center.

Today, they are a member of the newly-aligned Naval Air Warfare Center's Aircraft Division, formally established January 2, 1992 as part of a Navy-wide effort to streamline operations and provide more efficient and responsive service to the fleet. Their nearly 3000 employee workforce operates a \$350 million, 14 acre facility, providing capabilities ranging from advanced applied research to depot maintenance. They share in the responsibility for advancing the Navy's effectiveness by creating new, improved, and cost effective

equipment through research, development, design engineering, technical evaluation, pilot manufacture, overhaul, repair, and modernization of avionics and related equipment. Naval Air Warfare Center, Aircraft Division, Indianapolis (NAWC-ADI), has become increasingly involved in the management of large electronics design, development, and manufacturing programs in industry. As a Defense Business Operations Fund (DBOF) activity, they operate on a direct buyer-seller basis with customers. Revenue on assigned projects is obtained only through financial discipline, efficiency and productivity performance comparable to private industry.

C. QUALITY IMPROVEMENT HISTORY

A historical perspective focusing on initiatives to improve performance and product quality is essential to understanding the events that led to the internal structural reorganization at NAWC-ADI in 1992. Examining the evolutionary pattern of dissatisfaction with the "status quo" and continual striving for achieving improvements in performance and product quality improvements is useful in understanding the factors that were significant in developing and instituting a reorganization as swiftly and comprehensively as was achieved in 1992.

1. PRIDE

The beginnings of the Center's concern with quality improvement can be traced back to the Vietnam era when a zero-defects (ZD) program known as PRIDE (Personal Responsibility In Daily Effort) was initiated. Through a method of "doing things right the first time," it was hoped that zero defects would be achieved. An elaborate, outdoor, "all-hands" kick-off ceremony was held featuring the Assistant Chief for Production and Quality at BUWEPS, Admiral Sager, as guest speaker. The team-led program included plans for:

- Establishing PRIDE achievement awards
- Giving credit to individuals and groups for ZD achievements.
- Installing charts in various areas to evaluate and publicize progress toward ZD.

The PRIDE program was a first step toward focusing on quality improvement. PRIDE program efforts continued throughout the 1970s at the Center but fell short of management's expectations for quality improvement.

2. CAPS

Quality circles formed the basis for new industrial relations at NAWC-ADI. They were launched in April of 1982 under the title of "CAPS" (Creative Approach to Problem Solving) and they continued the process of increasing employee involvement in the quality improvement effort that began with the zero-defects initiative. Despite the failure of CAPS teams to dramatically improve operations during the mid-1980s,

it helped to firmly plant the idea that workers, as well as management were responsible for improvements. It also recognized the power of teaming as an approach to problem solving. Teaming could enhance an organization-wide understanding of common problems and an appreciation for other's requirements and capabilities. It could provide the opportunity for people to learn from others upstream or downstream from one's operation and to recognize the value of the unique talents and insights that team members brought to bear on common problems.

But the corporate culture at NAWC-ADI had not yet accepted teaming as a method of attaining continuous improvement. A former branch manager describes the frustration he experienced from this inconsistency between the Center's culture and teaming efforts.

I was pleased to get off of one of those teams I just don't think we were effective, mostly. We had a lot of ideas but we didn't know how to proceed. There was still the sense then that, "Well, [do] you want me to work on continuous improvement or do you want me to do my job?" The culture had not changed [to] where continuous improvement was part of the job and it was just something to do as a normal part of business.

Corporate focus was elusive.

3. Deming: The Turning Point

In the spring of 1988, the Executive Director (ED) and a large part of the Center's senior management attended the same session of Dr. W. Edwards Deming's course "Quality, Productivity and Competitive Position". Dr. Deming's

philosophy provided the world view that had been lacking in the Center's previous improvement and strategic planning efforts. A manager with over 30 years at the Center observed,

[O]bviously part of it, I think, was the lure of it--something different. ... I think when we started doing Deming ... and we started listening to what he had to say, I think he gave us a different slant on how you want to operate--that there's a world economy growing out there that's going to influence, ultimately, our economy and into DoD. [W]e still weren't talking about BRAC [Base Realignment and Closure Commission base closings]. Those were never an issue. But in practice, I think it was just a general concern that if we want to be the type of organization we think we are, then we're going to have to start making some changes.

During the week-long session the department directors and Executive Director thrashed out the general concepts proposed by Deming and walked away with a common understanding of the potential for application at the Center. The application the directors envisioned was a keystone philosophy that would guide the short-term and long-term planning and operational decisions. Prior to the Deming session, each director and manager approached corporate strategies by making operational decisions from his or her functional orientation. The result sub-optimized the accomplishment of corporate goals. After the Deming session, the directors reached a consensus that all functions (i.e., Departments) played a mutually supportive part in accomplishing corporate goals. Each function had to be understood in terms of its contribution to the process that would produce the corporate goals. Once the functional contributions were understood,

each director had to integrate requirements, plans, and emergent demands into day-to-day decision-making that kept the function focused on its contribution to the corporate goal. Although each director agreed with the general consensus of the need to apply the Deming philosophy, no one knew exactly how to put it into practice. In reflecting on this post-Deming training period one manager remarked, "You know, we got Deming (there were the 14 points or so). Well now what's that mean to us? We got vision and values. Okay. Now how are we going to implement some kind of a change?". In fact, it would take some time before their vision completely manifested itself. Nevertheless, as their first step, the directors enrolled in a course of action they referred to as a "PhD in Deming".

The "PhD in Deming" was a search for a practical way to avoid sub-optimization. One of the major causes of sub-optimization appeared to be the strong sense of independence exhibited by each department director. This phenomenon had a variety of causes, including the Center's history of a strong, control-oriented hierarchy and the traditional competition for resources and authority among the Departments. The "PhD in Deming" approach was an attempt to define exactly what the tenets of Deming's philosophy meant at the Center, and thus how each director would apply the philosophy in his organization. The group of directors met with the Commanding Officer (CO) and the ED weekly to discuss

specific issues that seemed to characterize areas the organization could improve through the application of Deming's philosophy. It became clear in these meetings that the major issue facing the organization was the operation of organization itself -- each department was operating as a "vertical chimney" with a separate agenda, priorities, and organizational values.

The attempt to deal with the isolation of departments into vertical chimneys produced two major products that better prepared the organization for the future; a published Vision and Values Statement (Appendix C) and the formation of a specifically defined leadership forum, the Continuous Improvement Council.

4. Vision and Values

Although the group of directors agreed on the need for a corporate statement of what the Center should be and how it should operate, the Vision and Values Statement was not written by committee. The CO and ED, the military and civilian leadership of the organization, defined the Vision for the Center to be "... recognized as the leader in avionics and manufacturing excellence." They also outlined eleven Value Statements to serve as the operating norms for the Center. These values focused on continuous improvement, customer satisfaction, respect for personnel and their contributions. They emphasized manufacturing excellence, high quality, innovation, commitment, technology, and integrity as

well as fostering an environment where employees could reach their potential and make positive contributions to the community. These Values resulted from hard business decisions, amply discussed during the weekly meeting with department directors, but developed by the CO and ED. The Values directed how the Center was going to conduct business and the relative importance to attach to factors in making business decisions. While the Vision Statement set the direction for the organization, the Values Statement set the organization's code of ethics and operating norms. The Vision and Values Statement was published for the Directors and all employees as the organization's ultimate tie-breaker to use in resolving conflicts between the department "chimneys" and in making decisions within chimneys.

5. Continuous Improvement Council: Phase I

The Vision and Values Statement was published in February 1989. Hard on the heels of this was the formation of the leadership forum for implementing improvement in accordance with the Center's Vision and Values, the Continuous Improvement Council (CIC).

The CIC was made up of the CO, ED, and all department directors. The CO and ED formed teams of directors to lead a shadow¹ organization of Focus and Element teams.

¹The term "Shadow" (Schein and Greiner, 1977) in this thesis is meant to be interchangeable with "Parallel learning structure" (Bushe and Shani, 1991) defined as a supplemental

Within a year, major progress had been made toward cultural change. The Deming training was used to sharpen the focus of the organization on quality and continuous improvement. But it did more than that. The teaming approach to work at the center introduced workers to one another. The frustrated branch manager who had asked "Do you want me to work in continuous improvement or ... do my job?" described the changes that took place at the Center in 1988.

The cultural change that went on in that year was just amazing. It was enormous. There had been major steps made during that period. We went from an organization [where] you may never meet, know, or even recognize the face of somebody in another department, ... to [working] with them daily. And you knew them.... That's one ... thing [CIC] did was it introduced everybody to everybody. And it started that cross-pollination. There was still a lot of frustration ... [but] whatever [CIC did] was worthwhile just because of the cultural change that they got.

a. Focus and Element Teams

The terms "Focus" and "Element" teams came out of a series of marathon meetings held after the Center's first experience with organized strategic planning, discussed earlier. Those meetings produced a list of areas (e.g., business, people, culture, etc.) on which the Center should focus its efforts with specific elements in each area that seemed to be critical to making improvements. These teams

"structure" operating "parallel" (in tandem or side-by-side) with the formal hierarchy and structure with the purpose of increasing an organization's "learning" (creation and implementation of new thoughts and behaviors by employees).

were composed of Center managers and employees and marked a turning point in moving toward continuous improvement. One manager recalled,

That was the first real attempt at looking at continuous improvement, first, but also in bringing people from across departmental boundaries together, on a team to work together, and it kind of crossed the grade level boundaries ... it wasn't just the executive directors It was still, basically, management teams. There were a few that I know of, people who were not in the management, on management staff. But at that time it was still few and far between. ... But that was kind of ... the real first step that we took after the Deming thing.

The Focus and Element team members received training in disciplines such as team-building, process analysis and problem solving. The teams were dedicated to identifying opportunities for improvement and implementing needed changes. As the efforts of these cross-departmental teams intensified, a whole new view of management-employee roles evolved as ideas like teaming, employee empowerment, and process improvement began to emerge.

(1) *Operating Rules.* The operating rules for the Focus and Element teams were:

1. Use cross-functional team membership to improve communication, instill a customer-driven quality and process focus, and increase problem-solving potential within the Center.
2. Facilitate team operation by focusing on problem-solving, not direct solutions.
3. Make participation on CIC teams a top priority for department directors and their employees.

(2) *Performance Review.* During the first few months of Focus and Element team activity, their effectiveness was measured by the CIC in terms of the number of teams established, the number of people participating on teams, and a general sense of how well the teams were progressing. As the months wore on, however, the CO and ED became more and more dissatisfied with the reported progress. In their view, this shadow organization created by the CIC did not appear to be making a significant impact on the areas it was created to improve.

Therefore, in the summer of 1989 the CIC held a massive progress review of all Focus and Element teams. The review involved short briefings by each Element team on each issue the team was working. The CIC expected to find that the Focus and Element teams were less than effective in making real improvement gains because of their operating characteristics (cross-functional, process oriented, and participative). It was felt that the cross functional character of the teams might be detrimental to their effectiveness because of the lack of familiarity of some team members with details of a particular task, for instance having a clerical worker on a team looking at a manufacturing process. It was also felt that the process and participation orientation would hinder the problem solving effort because of the time that it took to analyze processes, educate team

members and develop consensus for solutions. The very thoroughness of the process could be both an asset and a liability. One manager described it this way,

It seemed to me ... a lot of times that leverage change replaced risk taking. There's no risk if you go through this leverage change. ... If you want to be competitive, you better take some risks. You go safe and that will mean you're closed.

Instead, the CIC found that the teams were working hard on the issues they had identified, had come up with several good ideas, and were pushing the functional organization hard to implement the ideas.

It became clear to the CO and ED that the Focus and Element teams were effective at identifying ways to improve but were encountering difficulty in implementing their ideas. The source of the difficulty in implementation seemed to be from management. Therefore, the review of the Focus and Element teams led the CO and ED to also examine the contributions and progress of the CIC as well.

It was determined that the members of the CIC had generated an immense amount of awareness and activity in the area of continuous process improvement. Management had started to look deeper into the organization for help in developing solutions. One manager described the increased involvement of front line workers in managing problems and developing solutions,

We didn't have ... the people who work in the trenches ... involved in the solutions [in the past]. We're much closer to that now.

Difficulties appeared, however, when workers (or managers) were randomly assigned from various departments to solve problems.

While cross-functional teaming had improved intra- and inter-departmental communication, it was felt that those responsible for actual implementation of the ideas needed to participate in solving the problem and developing the solutions. The same manager noted

... people who didn't own the process or who weren't responsible for implementing the solution ... were coming up with all the good ideas as to how to fix them. ...[W]e want to have the people who own the processes or who work on it everyday be the ones who come up with the ideas as to how to fix it. And that wasn't where we were coming from in the CIC.

The CO and ED gave great credit to the CIC for increasing the understanding and acceptance of the Center's Vision and Values Statement. The ED observed,

We tried the CIC. Some say it was a grand social experiment that didn't achieve anything. But it gave the department heads an appreciation for others' requirements and capabilities. They discovered the possibility of learning from those both upstream and downstream from their operation.

These awareness and teaming efforts were seen as valuable to some degree. But they were not enough to break the stranglehold the "vertical chimneys" had on the organization. As the ED described it,

[W]e were getting minimum improvement. The departments saw problems only within their own department. We had a class system ... [T]he most highly resourced [department]... had the most clout and attention. We didn't have a corporate focus. There was contention between departments. Corporate problems were being

divided into departmental segments. One example is I had a report that a customer was unhappy about something. I took this to the five operational department heads and each of them said that in their department they were doing everything right (so nothing should change) but the customer still had a problem! But we could identify no way to resolve it within separate departments. Problems got cut into pieces and taken into department for solution and that wasn't working. The same thing was true at the working level. We tried to get people to think as a team, to think about upstream and downstream issues. But many managers were focusing on controlling and blocking ideas rather than championing ideas.

A department head gave his perspective on the situation.

... [W]e weren't making any progress and kept running up against, "Well, engineering is off working concurrent engineering and manufacturing is off working high velocity manufacturing." [But] the real constraints [were] that the manufacturing people [weren't] working with the engineering people and they're both perfecting the hell out of their own ... local optimals, but we're not working together!

It was determined that it was not enough for a single group or department to support change recommendations. The support of all the managers was required for success. An Element team member summed it up this way:

We couldn't make managers change the way they did business, as much as we tried. It takes all the managers together to make [ideas] happen.

The Focus and Element teams, it was concluded, lacked the support of senior managers for successful implementation of their ideas. One Focus team member noted:

The CIC was all managers. It was **all** the managers, but that's about all it was was managers. ...[A] line organization ... can't make it happen. ... But the best we could ever do was get to a point where we could offer [solutions].

This review led the CO and ED to look for ways to develop the inter-departmental management support necessary to implement Focus and Element teams recommendations.

The CO and ED felt that the CIC lacked a method to carry over the recommendations of the Focus and Element teams into concrete improvements in the functional organization. This presented a paradox to the CO and ED. They had purposely made the department directors the leaders of the functional organization as well as the leaders of the CIC shadow organization to provide the transition from CIC ideas to functional improvement. It appeared to the CO and ED, however, that Department Directors were somehow separating their role as CIC leaders from their role as functional leaders -- that the same persons were endorsing improvement recommendations as leaders of CIC Focus teams but rejecting these ideas as leaders of functional departments. In addition to hindering the implementation of ideas generated at levels subordinate to them, they also managed to block the implementation of ideas from the leaders above them. One mid-level manager explained how he saw this occur from his perspective.

[The Executive Director] wanted the [department] directors moved off the second deck and down to the [shop] floor ... for three years. ... But the department directors didn't want to do it and they just kept reinterpreting the direction [with responses like] "Well, we want to study this and we'll put it to a board [for a decision on the matter]."

To break this paradox and address these concerns with the department directors, the CO and ED initiated a series of weekly meetings.

b. Management Leadership Meetings

Management Leadership Meetings (MLMs) were established to provide a forum to integrate actions initiated by the CIC (and the Focus and Element teams), departments, CO or ED within a framework focused on organizational improvement. The CO and ED conducted these meetings to provide a method for turning recommendations into concrete improvements. At least three concrete improvements resulted from the MLMs:

1. Center-wide expansion of an initiative of the manufacturing department, High Velocity Management (HVM).²
2. Adoption of the Leverage³ process as the standard method for examining and improving work processes.
3. Identification and documentation by the department directors of the roles and responsibilities of their departments in providing added value to customers.

By the spring of 1990, the MLMs had progressed to the point that some further effort was needed to unite the

²High Velocity Management is a management method designed to reduce the time it takes to convert customer orders into cash receipts by eliminating activities that don't add value to work in progress (Nickerson, 1992).

³Copyright 1992, Arlene B. Nickerson, The Leverage Company, Inc., Greenwich, CT. For a more complete discussion of the leverage model, see Houghlan, 1993.

various fragmented improvement activities. The CIC was concerned with the Center's operational performance, especially schedule performance, product cycle time, and financial management and control. At the same time, the CIC was convinced that the operating characteristics of the CIC shadow organization and similar activities such as HVM and process improvement teams had produced the only encouraging signs that continuous improvement was attainable. As a result of the MLMs, the CIC decided to revamp the continuous improvement effort by retaining and strengthening what seemed to work and eliminating what didn't. This restructuring resulted in the major product of the MLMs, the Center's Goals and Strategies.

6. Continuous Improvement Council: Phase II

a. Goals and Strategies

The Goals and Strategies (Appendix D) were published October 1, 1991 and represented Phase II of the CIC process. The organization of the Goals and Strategies maintained the successful characteristics of the Focus and Element teams. For instance, the Leverage process was adopted as their standardized approach to problem solving because of its usefulness to the Focus and Element teams. It addressed weaknesses that they had experienced with Focus and Element teams not being able to reach a sense of closure. A branch manager described the problem as,

... Teams didn't know how to form and finish the job. There were no processes. The frustration without [the Leverage change process] was we had no way to put a team together and make a change. No way for them to brief it out, and no way for them to come to closure. ... We went through this period of a "bijillion" teams and no way for them to close ... without management action. ... We set up teams. Their job would be "People". There's no closure to that! It wasn't clear what the thing was supposed to do. ... Not only did they not have a way to close, you really [needed] a mechanism to communicate what they found out.

This lack of closure and lack of a method to communicate results spurred them to better define improvement measures for their teaming efforts.

b. Department Roles and Responsibilities Review

The CIC also assigned department directors leadership responsibility for Goals and Strategies that were most directly related to their functional responsibilities. This established specific areas and priorities to guide improvement efforts. The Focus and Element teams of Phase I were analyzed as to the applicability of their efforts to the Goals and Strategies and then were either eliminated, redirected or continued as Continuous Improvement Teams (CITs) and Continuous Improvement Action Teams (CIATs).⁴ Once the efforts were reorganized and prioritized, the Department Directors began to analyze the process of making improvements

⁴The CITs and CIATs used the Leverage process mentioned earlier to define and analyze processes and provide improvement recommendations. The CITs would define the process and the top three constraints to improvement and the CIATs would then look at ways to overcome those constraints to improve the process.

by examining in depth the roles and responsibilities each functional department had in accomplishing or supporting the Goals and Strategies.

The examination of department roles and responsibilities was organized by the relationships of the departments to supporting three categories of impact on customer/project outcomes. The first grouping involved departments primarily involved in project management and project execution: the Plans and Programs, Systems and Technology, and Systems and Engineering Departments.⁵ The next grouping of departments involved those whose functions added value directly to the project: Manufacturing Technology, Product Assurance, and Contracting and Material Management departments. The final grouping involved departments whose functions provided general business and enabling support to others: Security, Comptroller, Civilian Personnel, and Technical and Operations Support departments.

This analysis of roles provided the department directors with an important shared experience in the continuous improvement process. In examining the functional roles and responsibilities of the departments, each director

⁵ Actually, this was the second time these departments had attempted to sort out their various roles and responsibilities. A couple of years before, these departments had examined themselves in terms of program management, project leadership, customer advocacy, and Center workload management. This first attempt by these three departments had improved communication in some areas, but had become moribund by this time.

operated from a background of commonly learned lessons. They learned that organizational functions added value only when they contributed to the common goal. They also learned from diligently following the Deming's recommendations to move gradually toward continuous improvement. One manager explained,

You've got to stop, take small steps, little in terms of what we use to meet continuous improvement. You just can't wait to put the whole package together and institute it. You've got to start on a process of realizing where you are. You've got to start moving toward where you want to be... because we all had a tendency... to say that unless we can do the whole thing, we can't do it at all. And so I think that was maybe one of the paradigm breakers that came along the line. I think it started opening our eyes a little bit on... trying to move away from a controlling type of work force, a doctrine we all grew up with, a culture that's difficult to break.

This incremental approach yielded some real benefits; they had published the Vision and Values Statement, constructed a shadow organization dedicated to continuous improvement, changed people's operating norms to encourage cross-functional process-oriented teaming, and united and prioritized improvement activities under the Goals and Strategies. Yet still there was a growing sense of frustration with the pace at which improvements were being made and a growing realization that the inefficiencies caused by their functionally structured organization prevented the Center from operating at its full potential. The CO and ED concluded that as long as the functional separation of tasks, resources and project priorities existed at the center,

organization-wide customer focus remained elusive. This conclusion was not reached lightly.

7. Constraint of the Current Structure on Improvement

The initial tendency to reorganize was strongly resisted until lengthy analysis and other efforts had been exhausted. But as one CIC member described it, their functional management structure had created a "vertical chimney trap".

I guess that anyway at some point, [the CO and ED] must have decided that the organization was a constraint to us improving. You know, it's so easy, probably in DoD as well as anywhere else to say that the real problem is the organization. 'Let's just reorganize and everything will be fine.' And we sort of fought that [tendency to use reorganization as a scapegoat for solving our problems] for a long time. But ... what we did in the Focus and Element teams and the CIC--maybe in the Goals and Strategies--we got to a real recognition that our vertical organization ... this idea of vertical chimneys, where you don't have the horizontal communication, the horizontal cooperation It just felt like we were very much caught in that trap.

The task of the groups of departments at this point was now to break through the organizational structure constraint.

III. REORGANIZATION

A. DEFINING A STRATEGY

The need for reorganization had built to a consensus among senior management at the Center. The detailed reorganization planning and implementation procedures, however, had yet to be devised. These would be greatly influenced by conditions in the Center's operating environment and the organizational capabilities to respond to opportunities in that environment. The final shaping of the plan for the new organization would ultimately be influenced by these factors, whether explicitly stated, or implicitly understood.

1. A Sea of Change

The Center's operating environment was greatly shaped by American industry's struggle to regain a competitive edge in the 1980s. The Japanese had made tremendous inroads with American consumers and American industry was increasingly becoming part of a more competitive, global economy. Yet the massive buildup of America's defense under the Reagan administration provided ample opportunities for DoD activities to maintain what appeared to be an immunity to these economic pressures. But soon NAWC-ADI too, was experiencing economic pressures of its own.

By the end of the 1980's America had won the Cold War with the great Soviet empire. Reagan's plan for a 600 ship

Navy and all the corresponding aircraft and systems to support it--had expired before it was complete. The world had seen the Berlin Wall come down and the Union of Soviet Socialist Republics disintegrate. One manager who attended a Deming training session with the CO and ED and was later to become one of the key change agents in the reorganization described the impact of these changes.

I saw [Deming] over at Dayton and he just said things that made sense. He talked about national competitiveness..., 'There's no inherent competitive advantage by being an American. The Japanese are understanding their businesses and improving it and focusing on their customers,' and all that made a lot of sense. You could see it happening in the automotive industry and aerospace... consumer electronics. [But] I don't think there [were] any... competitive pressures on us at the time. We were doing well within our competitive environment. [W]e were sitting there fairly complacent... dollars coming in... everybody employed... hiring people... none of this external crisis. You could see it out there, I mean you knew [it was there]. And then the Berlin Wall fell. [W]e sat around that morning... and said, 'This is a sea change.' [T]hat and Deming... just sort of blended together to where we realized that it was going to be *survival of the fittest* and we wanted to be both surviving and fit.

2. Performance

The Center's organizational capability to perform as defined by such metrics as on-time delivery, cost containment, etc., was a major problem facing the Center that now came into the limelight. A bespectacled executive who had risen through the ranks put it this way:

I think people were recognizing there were certain problems within the organization. ... I mean you see schedules, you see lack of performance, things ... that are attributed in end-product. You might even see it in morale. You might see it in cost or schedule issues. I

think those were the manifestations, the eruptions on the surface ... of other problems below it. Whether it was a cost overrun on a program, whether it was a quality issue on a particular program, whether it was his missed schedule. ... [W]e were looking at particular programs, center-wise, and say[ing], "Jeez, we're only meeting thirty percent of our commitments. Why is that?" But it was things that we hadn't [been asking] before. [A]s long as you got a product out, whether it was late, whether it was over cost, whether it ... had some problems, that was all kind of secondary issues. I think as we were coming to the end of the decade, people were starting to say, ... 'This isn't right.' Maybe we're looking farther ahead a little bit and we recognize that we can't continue to operate in this vein if we're to be successful."

3. Human Resources

More efficient use of increasingly scarce resources, especially manpower, would eventually shape planning and execution of NAWC-ADI's restructuring effort. Work at NAWC-ADI involves understanding of complex avionics and weapons systems and requires superior cognitive abilities and competencies. Expert and technically competent people are needed to maintain their technological edge. Thus as government hiring freezes took effect, increasing the efficient use of manpower was one of the first areas that became an issue. NAWC-ADI realized they would have to make do with the work force they had in place--a certain number of people with a certain skill base. One manager contrasted the Center with civilian industry:

We can't be a General Dynamics or something that says, 'This job's over with. You people are gone.' and hire in a new work force, for the next program. You've got to ... make do with what we have, as much as possible.

The value of every person's activities was being closely examined leading management to ask "What is the value added of [what we're doing]?" "Why are we inspecting? Why aren't we building quality in?" This examination lead one executive to conclude, "ultimately we realized the business was going to be changing." No longer could they tolerate inefficiencies or underutilized human resources.

A situation that brought the issue of manpower efficiency into sharp focus was when a major mission system program required the establishment of a new hundred person Software Support Activity (SSA).

When you start looking at the numbers of people for a single program and... you start looking at [manpower requirements for other impending SSAs] people would say, 'Where are we going to get these resources from?' and 'What are we going to do?' [I]t was an issue that was related to us at a corporate level because... in that era... we were only going to be able to hire so many people... a large majority of them [were] going to have to be software people and they [were] going to have to be part of these programs. And so that forced a lot of thinking of, 'Where [do] the shortfalls occur in other areas?'

The Center could no longer presume (given the hiring limitations) that they could meet new project commitments with new hirings. A mechanism had to be developed for internally developing the required competencies from their existing pool of workers.

For the Center to enhance its ability to compete with a limited number of employees, talent could no longer be hoarded and unproductive workers needed to be developed, not

hidden. The Center at one time had been structured and operated as a corporation of competing "companies" all under one roof. A manager described the effect of this competitive management style on the use of human resources.

People [managers] had a tendency to look at their branch or their division as their domain. And while they may not have the work, the direct work for a whole work force, they weren't prepared to release any of that work force to another company. [B]ecause once that was lost it was never regained again. [If] Joe Shmoe is... only fifty percent loaded... and he's an excellent talent... [and you would] go to that division director or that branch chief to try to get that resource for your program because it would match what you needed, [you would be told] Joe wasn't available. Resources were being hoarded as a method of saying, 'Jeez, I'm going to need [Joe]. I consider [him] a very important resource. I'm going looking for work and when I get that work he's going to be on that program.'

Because of the hiring freeze, every available worker needed to be developed and working up to his or her potential. Firing employees would only exacerbate the personnel shortage but there was little or no incentive to spur development or training of unproductive workers. One manager stated,

... we needed [to do something with] people that were not very productive. [We] couldn't necessarily dump [dead] wood.... [Y]ou found programs who had 'Harry' sitting on the program, charging to the program but not doing very much ... [but] there was not very much of an ... initiative to try to train those people

B. DIRECTORATE CONSTRUCTS

In the late summer of 1991 a need for quicker response and faster improvements in NAWC Indianapolis' business efforts became apparent to the Center's leadership. It was also apparent that a major barrier to facilitating these needs was

the organizational structure itself. The executive leaders, in a bold and unprecedented move, brought together a group of middle managers from across the Center to study this issue. They were to be known as the Center's "Constructs Team".

1. Team Selection

The Constructs team consisted of 18 division and branch-level managers. The Center's ED explains how relying on mid-level managers for solutions provided objectivity unfettered with "turf" concerns and enhanced support for proposed changes.

We used a team of mid-level managers to define and implement the reorganization. That helped. They were better representatives of the organization in terms of the change that needed to happen. You can't take the people from the top and ask them to reorganize; that asks them to be too critical of themselves and that's not human nature. It worked well having the middle managers; they could be more "critical" of their own organization. They weren't the candidates for the key jobs so that allowed them to be more objective. If you're willing to trust middle managers with this planning you are taking a major step toward empowerment. Also, in significant change, that piece of the organization that is most impacted is the middle managers and you get more 'buy-in' by having them do the planning.

Using mid-level managers allowed the Center's leadership to work around the problems presented by the "turf battles" senior managers might encounter. The ED continued their praise,

They ask[ed] good critical questions of the senior managers. ... We looked for quality people; those who were open to change, could jump horizons, could postulate how the organization could work [at all levels]. They were very mobile.

Giving middle managers the responsibility for implementing any new plan of operation helped to establish them as proponents for organizational change. But before this team of middle managers could work full time developing strategies, the Center's leadership needed to provide them with their objectives.

2. Team Mission

The team was chartered to determine the structure most suitable for improving the Center's business efforts (for example, *developing customer focus*). The senior executive tasked with organizing the Constructs team described it this way:

We confused ourselves and our sponsors because we managed projects out of every department and we couldn't explain to ourselves why we did that. We had... projects that needed matrix support from the other departments, but the other departments had accountability and responsibilities for [their own] projects.... So in this conflict, we always wanted resources. Eventually [it was] decided that all projects in this new organization would be run out of the same department [and] a group of division directors [began] planning how we would reorganize. We selected about twenty people... and we asked them to kind of base line where all the people were, what kinds of people were on... what kinds of projects. We were just trying to get a snapshot of where we were. ... It was clear to us that we would organize with the intent to better serve the customers.

C. CONCEPT OF OPERATIONS

It was determined that what was needed was a new Concept of Operations. This Concept of Operations would have to adequately address how projects were to be managed at NAWC as well as development of workers and utilization of human

resources. This planning would certainly require a concentrated effort with limited interruptions.

1. Concept of Operations Team

After approximately six weeks, the decision was made to establish a subgroup of the Constructs team to draft this new Concept of Operations relative to the leadership areas, three directorates and three levels of leadership.⁶ Joining the Concept of Operations team would require persons to leave their operational managing duties for an extended period of time. On October 15, 1991, a ten-member Concept of Operations (ConOps) team was pared out of the Constructs team to develop these concepts with a three-member Steering team designated to guide their efforts.

a. Team Selection

The executive who organized the Constructs team and eventually became one of the three members of the Steering team describes the selection process,

I had realized that [the Constructs team] was too big. So we divided the group in two. We sent half of them out to greet people about what we had done so far and kind of create some of the awareness and hype and all that good stuff so that people knew what was coming down. And we took the other half and [they became the ConOps team]. We didn't have any really formal criteria... you looked at people's energy and personality... and it didn't have anything to do with how busy they were or anything else. We just said, 'We're going to pick you guys. You're going to step out of your job.' And eventually I think we three advisors stepped out of our jobs [too]. There wouldn't be anything there to come back to anyhow.

⁶Reference: Directorate Constructs Team minutes, 10/15/91.

Representatives of each of the major operational areas of the Center were assigned to the ConOps team. The Systems & Technology and Systems & Engineering departments each had two members from their departments as members while the Plans and Programs, Manufacturing Technology, Product Integrity Assurance, Civilian Personnel, Contracting & Material Management, and Technical & Operations Support departments each had one mid-level manager assigned. The Center's Special Assistants, Security, and Comptroller departments were not part of the ConOps team.

b. Team Mission

From an off-site location (a facility formerly owned by Western Electric) the ConOps team was to begin inventing a workable concept of how the Center would operate. They met from October 17, 1991 to January 15, 1992 and through a formal process, they developed a model for a vision organization and a new way of doing business. The basic question before them was "What organizational structure will best serve the customer from a customer's point of view?". One of the Steering team mentors described their mission:

They were given broad goals like customer focus, but not told how to do it. They were asked to start with the issue of how the organization would operate and that the last issue should be the 'wiring diagram'. Then the boxes would emerge from the operational processes.

Their present structure had project oriented design functions and process oriented manufacturing functions. They needed to

design an organization that provided the proper focus on both projects and processes.

2. Concept of Operations Steering Team

It was determined that the ConOps team needed a link back to the executive leadership as well as a liaison with other senior managers and executives. It was also felt that the experience of more senior managers who were "on board" with Deming management philosophy would be a valuable resource for the ConOps team. A three member team, therefore, was chosen to provide this link, liaison, and experience.

a. Steering Team Selection

The Steering Team (or more commonly referred to as the "mentoring team") membership was hand picked by the ED. He describes how they were selected.

We chose three leadership champions to be the mentoring team link between the Western Electric planning team and the organization. I chose these three people because they were the ones who would disagree with me most. [One] represented the younger generation, was the most liberal and had an important view of the relationship between life and work. I chose [another] because he is very people oriented. [The third] is a traditional manager but is very effective in pursuing new approaches; he is a structured thinker. He understood our organization but knew we had to change. Their role was to be the champions for the off-site team.

This mentoring group appears to have been an essential part of generating support and acceptance of the new Concept of Operations among the department directors and senior executives of the former organization. These mentors had the seniority and political clout to bring about the acceptance of

new ways of thinking about operating amongst those that were firmly entrenched in the old methods of operation.

b. Mission

These former department directors were to oversee the ConOps team's efforts. They defined the overall goals for the ConOps team, provided guidance and support and served as liaison with the CO, ED, CIC and Constructs team concerning ConOps team activities. They provided a mentoring function to the mid-level managers by fielding questions, acting as a sounding board and shielding the ConOps team from outside criticism.

3. "Givens"

The Steering team provided 13 "givens" (see Figure 1). These "givens" were broad statements of the vision of the new organization. They were the qualities of the optimal organization for use as a guide in determining how it would operate. They were to provide focus for the ConOps team in developing the new concept of operations.

It was necessary to design a new concept of operations that would not intrinsically hurt people. That is, it would not require major layoffs or demotions to accomplish the new concepts, nor would other arrangements be implemented which would be seen as "hurtful". Customers were to be served better through more effective teaming, more efficient processes, fewer boundaries, and with clear lines of accountability. The new concept of operations was to result in a

more efficient organization using the best of the Center's current capabilities (including various design, development and manufacturing leverage points, customer requirements teams

1. Don't "hurt" people.
2. Serve customers better.
3. More effective teaming.
4. More efficient.
5. Fewer boundaries to process flow.
6. Clear accountabilities.
7. Minimize overhead.
8. Institutionalize leverage points/CRT/Corp plan/roles and responsibilities.
9. Preserves essential capabilities.
10. More effective use of investment resources.
11. Foster improved business practices.
12. Fits well with the Naval Air Warfare Center/Aircraft Division/Weapons Division (Leadership areas).
13. Balance project focus and process improvement.

Figure 1
List of "Givens"

(CRT) and corporate planning) and the best of their new management concepts (including total quality management, Deming's management philosophy and self-managing work teams). The new concept was to preserve the Center's essential capabilities, and make more effective use of investment

resources as well as incorporate processes for improving business practices. It needed to fit well with the parent structure of the center (Naval Air Warfare Center, Aircraft Division). And the new concept of operations had to balance the Center's external focus on meeting customers' project demands with its internal focus on improving the processes used to meet those demands.

4. Working Relationships

The ConOps team was given the responsibility and authority to create a new organization "from the ground up"; tampering with the process from anyone outside the team was not tolerated. The Steering team was available for assistance and advice; they allowed the group to evolve as a team and create their concept independently. The Center's executive leadership supported the team and its process approach, ever aware of the magnitude of the task. The total commitment to continuous improvement and desire to challenge traditional thinking in their conceptualization became instrumental in making the team successful.

a. Team Dynamics⁷

At their first meeting, October 17, 1991, the Steering team met with the ConOps team to explain the team's assignment. In recalling this meeting, team members expressed an understanding that they weren't just being asked to design

⁷All unattributed quotes in this section are from members of the ConOps team.

an organizational plan with new titles for old ways of operating. They were to change and redefine work processes from which a new management structure would evolve. More than one team member used the analogy of not wanting to "play musical chairs by simply putting everyone out on the front lawn⁸ and bring them back in with different titles and the same position." Their intent was to make a systemic change in how the organization operated. They would first have to overcome significant challenges before their vision would translate into a viable plan of action, however. Subsequent meetings established an initial agenda that included training topics such as teaming, organizational change, managing change, and defining roles and responsibilities.

(1) *Consultant.* A faculty member from Indiana University was consulted to provide training in organizational development and enhance the team's understanding of the impact of the changes they were being asked to plan. He was to assist in developing skills to effectively manage the reorganization as well as help them understand the theoretical aspects of organizational models. He emphasized to the team the great complexity of their task and the changes it meant for the organizational culture at NAWC-ADI. His experience indicated it took a great deal of energy and time to fully

⁸The entrance to the 14-acre complex is fronted by an enormous grassy area that spans the width of the complex.

implement the sort of organizational change that they were being tasked with planning. Months or years, rather than weeks or days, would be required before they should expect the new Concept of Operations to be firmly rooted in the new organization.⁹

(2) *Facilitator.* The facilitator function was performed for a brief period by one of the team members. He helped the team develop ground rules for team operation such as: be respectful of others' opinions, don't interrupt, don't evaluate during brainstorming, don't insult each other, etc. He also helped organize and structure the teams analysis and planning processes and worked with the group to develop their teaming skills. His role as team facilitator, however, was absorbed by the group within days. A fellow ConOps team member recalls the dilemma they faced of having a fellow employee as facilitator:

The facilitator is very good ... but he's also an employee here ... a very opinionated employee After a very short time, a matter of days, we said ... 'You're either a member of the team or you need to get out of here!' [Laughter] Because as a facilitator he could kind of control the tempo and the discussions. Well if you're ... a team member then you kind of share that. If you're the facilitator, you kind of control that. He was trying to give his opinion and kind of control how that worked.

⁹ from internal document titled "Tom DeCoster Roles and Responsibilities".

(3) *Team Leadership.* The team also originally designated one of member to act as team leader. While leadership of the team actually shifted from time to time to other members throughout the group, the "official" leader took over when the energy or direction of the group lagged. As one team member recalled, "We would give him the chalk when no one else wanted it." The basis upon which leadership rotated was not ad hoc; the leader at any particular time depended upon the particular issue being discussed and the expertise of the team members. One member put it this way:

It depended on the particular issue. Now, there were times when [someone] would be very vocal about something, times when I would be or times when they would look to a certain person because they had [a particular] background.

(4) *Members.* The team was manned with "strong characters" with a great deal of expertise in their particular backgrounds. They were **outspoken**, ("I'm generally pretty vocal. I think most people know where I stand,") **creative**, ("There were times when ... we were in awe of ... what [someone] just said, what they did or figured out") **expert**, ("... very sharp with picking up on the smallest things, the details of something") and **structured thinkers** ("He's a research type of person. He likes to do that. He's very good at it!"). And while they could vehemently disagree with each other, they were able to temper their passion for their respective viewpoints with a high level of esteem they held for one another.

There were a lot of times when we'd leave and go home angry with each other. But it's the only group that I've ever seen ... that still goes out to lunch [together] ... two years later.

(5) *Challenges and Commitment.* The ConOps team encountered several significant challenges together that may have been instrumental in forging their mutual admiration and respect. One such challenge appeared when it was noticed that a female member of the group was not actively participating and was being quieter than normal. After a team mate asked her privately about this matter, the woman revealed that she felt ignored by certain members of the groups when she spoke. She was upset by what she described as "a male dominated, chauvinistic atmosphere in the group." After being urged to personally address this issue, she spoke privately to those whom offended her and explained to them the effect that their behavior was having on her. By making other group members aware of the effects of their actions on others and confronting this issue directly, she helped to develop an awareness within the group that everyone had valuable contributions to make. As one team member stated

You couldn't just B.S. talking **for** her. ... She's articulate, but we needed to at least set the stage. And so she had a couple of sessions with a couple of people on the side just to say, "This is what you [are doing], this is the effect you're having'. And I think that was essential. And it didn't magically change, but I think it started developing [a sensitivity to the chauvinistic bias].

Another group member described how he felt his ability to better understand others was enhanced during his work in the ConOps team.

I know that for myself, I felt that I probably matured quite a bit, as far as a person, because I think that's probably the first time that I **really** listened to somebody else.

He described an argument he had with another team member over a topic he could not recall.

He made a statement and I argued about something, and he said, 'But look at it from this point' ... and it was like a veil fell away and I said, 'Oh my God! I've been saved!', you know? [Uproarious laughter] Now I understand. I completely understood. It was almost as though I had shifted over so that I could see it from his point of view. He explained it very well.

This sensitivity was important because it enabled the group to more fully exploit each members individual abilities; abilities that would be valuable in solving the challenges that lay ahead. Several members of the team noted a particular challenge that the team faced together early in their planning efforts that seemed to build a cooperative, collaborative atmosphere amongst the members.

The team, at first, had difficulty believing that the CO and ED had actually empowered their mid-level managers to make the radical changes that were called for. One group member tried to explain the difficulty they had in believing that radical change was possible by using the analogy of a large object trying to make a sharp change in direction.

We kind of had a false start. ... In any large organization, there's a lot of ... inertia and to make a right angle turn with that much inertia, we really kind of thought, is reaching. ...

The team members felt that in order for their recommendations to be viable, they needed to be only incremental, rather than dramatic changes to the current methods of operating. More simply stated, they may have been told they had a "clean sheet of paper" to start with, but their impression was there were at least "lines" on it upon which the new strategy was to be "written" when in fact, the paper was *completely* blank.

The major conceptual hurdle they faced was maintaining what they referred to as "the separation between church and state"; devising a way to allow persons to concentrate either "outwardly" on project operations or "inwardly" on people development and process improvement, not both. It required the creation of two separate managerial focus areas, one whose role it was to focus on project operations¹⁰ and another area whose sole responsibility was an inward focus on improving the people and processes that the project leader depended upon to satisfy customer requirements.¹¹ Dividing roles and responsibilities along these two managerial concepts (inward or outward focus) and

¹⁰Roles later defined as project areas leaders and project leaders.

¹¹Roles satisfied by members of Competency Center Management Teams' Process Improvement Associates and People Development Associates.

defining separate positions and working relationships, rather than combining them and forcing individual managers to divide their attention between these two types of responsibilities was the crucial idea that they first struggled to achieve. Their initial effort failed to define managers roles along these conceptual lines and when presented at a briefing for the CO and ED was completely "shot down".

So we came up with a new organization that would do *some* of the things [we had been asked to accomplish]. ... We thought, 'It's a step in the right direction. When some of these upper-level managers start moving out of the organization we can continue to make the change.' ... But we **didn't** make the turn. ... We *leaned* around that right corner... and [the ED and CO] pretty much handed us our hat. 'Wrong. Try again.' ... The ED essentially stood up and walked out. ... We felt like he just smacked us in the teeth with a baseball bat and left.... You could see it on our faces. We were just like deflated!

This same group member also vividly recalls, however, the CO's words after the ED left. The CO attempted to clarify for them the source of the ED's frustration with their attempt and strongly encouraged them to redouble their efforts. One team member vividly recalled his comments:

We're really looking for some "breakthrough thinking." We're talking about throw out everything you know about our organization and design it from the ground up. We're really looking for new ideas. Don't come back to us with something that looks a whole lot like what we have now, because we don't think that's going to answer the mail. ... C'mon. Let's get over this. You are doing good work [even if] you don't quite have the answer [yet]. ... Don't try to give us a shade [of how we're operating now]. ... We really, honestly are looking for *breakthrough thinking*. ... We're really going to listen to you. You can do this.

This strong show of support from the Center's CO seemed to spur the team to a higher level of commitment.

Even though they had difficulty developing the new concepts, one member in retrospect remarked that "at least they were taking [what we were doing] very seriously."

Another reason for their commitment was the risk they shared for the consequences of their efforts.

I think that if I were to give you the assignment to do anything, and you had a personal stake in it, (... it's going to affect the way you live or your job or whatever) you're going to look at it a lot differently than if I give that job to [someone else] that is not going to be affected by it.

Their commitment did not seem to come from any sort of selfish interest on the part of ConOps team members, but instead seemed to be rooted in being empowered to devise a plan that would ensure the Center's survival as a viable and competitive organization. In fact, one team member remarked about how they had seemingly laid their personal aspirations (in terms of what particular jobs they were going to hold or create for themselves) aside during their planning.

Most organizations do not go to their middle managers and say, 'Okay, you decide how we're going to operate.' That was probably a big one in our pocket to work with because we felt we were doing something important and we had a little bit of pride from that. ... We did not worry about where we were going to end up. Now, I don't know for sure. There could have been people ... thinking, 'Gosh, I wonder what's going to happen to me?' but that was never vocalized. We didn't even think about it. And we laughed about the fact that we didn't think about it, when it was all over.

Along with this high level of mutual commitment was a camaraderie that developed, a trustworthy feeling of interdependence. An "us" versus "them" attitude developed

that solidified the members as a team. They posted their motto, "Destined to be hated," in their workspace. Their wry sense of humor reflected an awareness that they would be to blame for anyone who was hurt by or who didn't like the changes that they proposed. They began to think of themselves as revolutionaries. One ConOps team member kidded that:

... We would probably be shot after the revolution when the old guard would be put in to do the boring stuff of running the country.... *This change is not easy, ... and when you're the advocate of suffering, you're not popular.*

(6) *Synergy.* Their growing synergy soon became apparent in their behavior. One manager recalled:

Once the synergy of that group got to a certain point, everybody started to notice that ... when somebody in the group said something, you had all the [other team members'] heads nodding the same way. And that's when we knew that we had essentially 'bought into' the whole thing. Being a group. Having this concept. Agreeing on what that meant.

This comment indicates the extent to which team members had developed a sense of common understanding of the concept of operations proposals they were to make.

The team members interviewed described it as one of the best experiences in their careers: a very positive and memorable, *peak* experience. But while they attributed it to just "good chemistry" and "good luck" amongst the team members, there seemed to have been other relevant factors that enhanced their ability to successfully accomplish their planning effort.

b. Command Support

The command support, previously mentioned was shared by the ED as well as the CO. The ED stated, "I knew we wouldn't fix the problems just by restructuring the departments. The changes needed to be driven by customer focus." But that shift to customer focus would require a significant cultural change at NAWC-ADI. This cultural change would require not only developing an understanding or commitment to the new concept of operating, but ultimately caused measurable behavioral changes at the Center. To not only believe in a new way of operating but to actually behave in a new way was their goal, and strong command support was required to reach that goal.

(1) *Mentoring.* Translating these concepts of the ED for the team were their "mentors" on the Steering team. They made themselves available to the ConOps team members to test new ideas. Their feedback was actively sought. As the command interface for the ConOps team, the mentors frequently provided updates to the other managers about the ConOps team's activities and actively solicited department directors to "sit in" on their meetings and activities. One of the mentors recalls,

... It was an open door policy. Anyone could go to the meetings. So a lot of the folks took us up [on that]. ... That helped the team because it showed the team that there was an interest; that they were supported. But it also helped some of our folks [i.e., senior managers] to realize they weren't over there in this dark, smoke-filled room creating this monstrous problem for us.

Ultimately, this open-door policy made acceptance of their efforts easier for the Concept of Operations team. One member stated:

... Our Steering committee left us alone to the right level... They were available but not very often. The ED and CO came when they were needed and .. didn't change ... what they wanted. ... [We were never told] 'Make sure they do this' or 'Protect that' or 'Don't do that!'

But this acceptance of their efforts was paved by work the mentoring team performed. One significant challenge was the fears that were generated by the reduction of Departments. Senior managers felt threatened by this reduction. There were clearly going to be significantly fewer department head positions available after the reorganization. This fear had to be mitigated with the commitment that no one would lose their jobs or suffer pay reductions as a result of the reorganization, that there would be no old organization to go back to and that the new organization would create new opportunities for positions that were not even conceived yet.

The efforts of the mentors helped the ConOps team feel that they had free reign to self-manage their activities and schedule (with the exception of a January 15, 1992 deadline), to gather data, educate themselves and come to grips with the salient organizational issues that they were chartered to address.

(2) *Market Testing.* While the ConOps team worked at an off-site location, they frequently returned to the Center to "market test" their ideas. As the team worked through the Leverage process, they generated ideas about where they felt the organization presently stood, how they would ultimately like to see it operate and function, and identified what they felt were constraints to reaching their vision for how it should operate. They would frequently return to the Center to discuss their ideas with workers and managers in relevant areas. They conducted surveys and asked probing questions to generate and validate their ideas.

5. The Leverage Process

The formal process used by the ConOps team was the Leverage process. This problem solving approach follows five basic steps to implement changes in processes:

1. Enumerate the reasons *why* changes are necessary.
2. Determine what the current organizational status is (*baseline "WHATs"*).
3. Determine what status could optimally be achieved by the organization with changes (*optimal "WHATs"*).
4. Determine the *constraints* to moving from the current status to the optimal status. Identify changes needed to achieve optimum result (*constraint analysis*).
5. Present ideas on how to facilitate changes necessary to achieve optimal whats (determine *"HOWs"*).

The Leverage process approach to problem analysis is time-consuming but can reduce internal cycle times and improve on-time product delivery. The greatest problem encountered by

the Center in using the Leverage process was inherent in the human factor: too often "hows" were focused on, before the other concepts were fully developed and understood. The Leverage process has been used by NAWC-ADI to highlight obstacles to meeting business and process goals.

a. Optimal "WHATs"

A vital part of the Leverage process is identifying "Optimal WHATs". Optimal Whats are the driving forces for an organization. These characteristics are "what" are considered to be of greatest importance, and thus should be "optimized." The following list of Optimal Whats was developed by the ConOps team. The list was proposed to and approved by top management and distributed to senior managers for their input and concurrence. The Optimal Whats became the cornerstone upon which the new concept of operations and reorganization were built:

1. Focus on satisfying the customer.
2. Improve the efficiency of processes/systems.
3. Future orientation (long-term planning).
4. Partnership within the organization (better communication, teaming).
5. Human resource management and development (competent, flexible, work force).
6. Clearly defined roles and responsibilities.

The paramount importance of a customer orientation is reflected in the ConOps team's first Optimal What. This reflected the Center's considerable time and effort spent reorienting their focus from telling customers what they needed to listening to what customers wanted. Customer involvement would provide key information about their operating environment and could help NAWC-ADI clarify their customers needs. NAWC-ADI wanted to approach customers as a unified organization instead of a collection of units. For these reasons it was determined that the customer deserved to be the prime optimal in developing the new concept of operations.

The second Optimal What chosen was to improve the efficiency of systems and processes. A sense that hierarchical "walls" built around the Center's functional organizations contributed to inefficient and burdensome systems and processes was reflected in reactions to customer requirements that were stymied by inflexible processes. It was determined that more efficient and responsive systems and processes would provide better service to the Center's Navy, DoD and other customers. Continuously optimized and easily understood, user-friendly processes and systems were required. Flexibility and adaptability to changes in workload and the environment were necessary. Systems promoting long-term accountability and informal networking were deemed desirable.

Third, concerted efforts by NAWC-ADI to evaluate its future direction were rare. Rather, it reacted, and generally accepted, the work sponsors brought it. What was needed was structured planning of the kind of skills, processes and leadership the future would require. The new concept of operation needed to emphasize planning in all aspects of NAWC's organization to position the organization to support DoD objectives, forecast technologies and product opportunities, formulate resource development actions, expand the customer base, and identify and manage risk.

Fourth, the hierarchical, bureaucratic nature of the old organization fostered competition and partitioning of responsibility among the functional department. These "vertical chimneys" were considered detrimental to overall operational effectiveness. Designing lines of communication and defining relationships in such a way as to foster functional equality was considered essential to creating an organization that practiced cooperation and created a sense of partnership that would enhance organizational effectiveness.

Fifth, emphasis was to be placed on human resource management and development. Effective management of skill development was considered essential for long-term success. Development through training and education would strengthen the Center's ability to meet future skill and ability requirements. A strengthened ability to manage human resources and predict human resource requirements as well as

integration of individual goals into the Center's development plans was important.

Finally, clear definition of all roles and responsibilities was needed. Development of systems designed to support good planning, scheduling, execution, tracking and feedback on all levels of authority was required in the new organization. This Optimal What supported the goal that the formal organization should be understandable to both internal and external customers.

6. Model Selection

Once the ConOps team completed the Leverage process, there remained a need for visualizing the structure and concept. During the Leverage analysis process, a study of alternative organizational structures had been presented by an outside consultant. The need for a visual, graphic presentation followed the decision to incorporate a matrix design into the Center's structure, and several variations of a matrix-shaped model were developed. Initial variations of the matrix model clung to a dual-hatted concept of management; these were determined to be unacceptable in light of decisions to better focus the energies of management and team members alike. Later models were more simply designed to eliminate the confusion of who was responsible for what functions, and balance the Center's efforts to satisfy its customers through a teaming approach with better development of processes and skilled, competent employees.

The final model (shown in Figure 2) turns the matrix 45 degrees to a "diamond" perspective with the Project Office on one axis and the three Directorates on the other axis. At the base is the Command Staff which provides support for the rest of the organization. This model portrays the team's efforts to focus on the six Optimal Whats as essential to a successful vision organization.

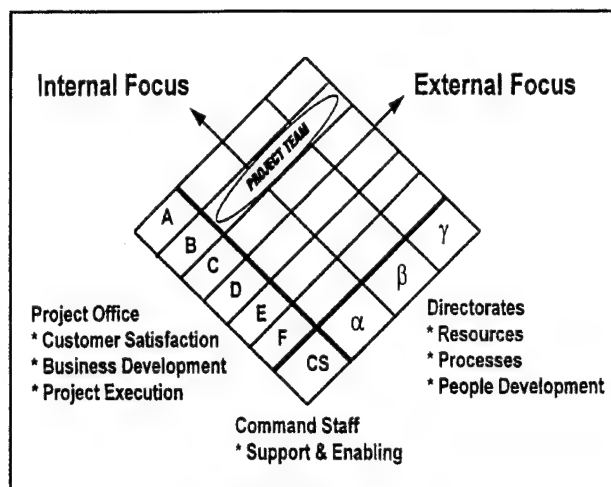


Figure 2
NAWC-ADI "Matrix"

7. Model Explanation¹²

The managerial structure that was developed and proposed for the Center by the ConOps team was a modified matrix. This proposal included a Command Staff, a Project Office, and three Directorates as the main components of their design.¹³ All components of the model are described below.

¹²Summarized from NAWC-ADI Transition Plan, May 1992 (organization document listed in Appendix B).

¹³This modified matrix was a concept that was formally accepted as a design for operations. Present operations are based upon these initial concepts but additions, deletions and other modifications have been made to the concepts reflected in this model in order accommodate new ideas and requirements.

a. Levels¹⁴

The operational portion of NAWC-ADI was organized at three levels (see Figure 3)¹⁵. Each level is tasked with developing people, continuously improving, instilling

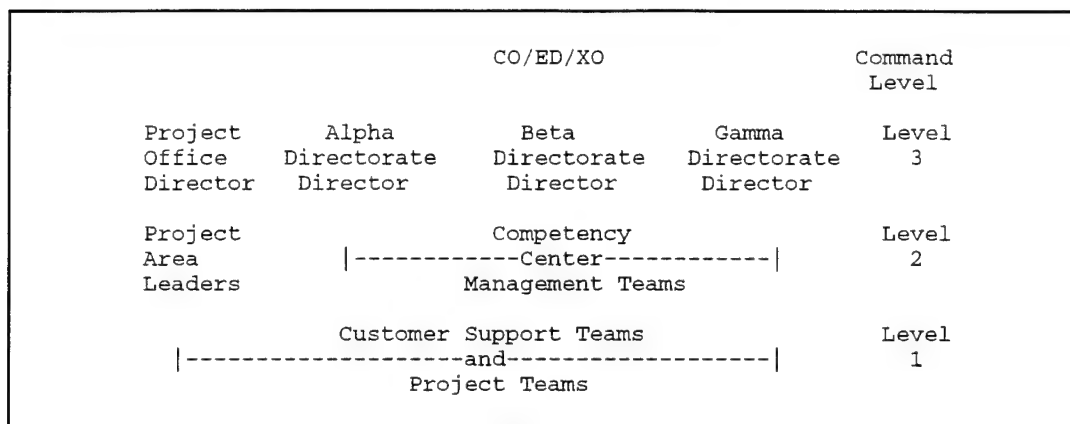


Figure 3

corporate values, marketing, providing customer focus, planning and measuring processes. But each level focuses on different horizons: how far into the future a person must look to judge the effects of daily actions and decisions.

Level 1, the Operational Level, is comprised of the working level Project Leaders, Project Team members and Customer Support Team members with a near horizon of one

¹⁴Ideas in this section are summarized from personal correspondence from Arlene Nickerson of the Leverage Company to the implementation teams dated 13 March 1992 titled Pipelines Implementation Planning, as well as from Arlene Nickerson's book Eat My Dust.

¹⁵This model was originally developed only for the operational functions at NAWC-ADI. The integration of Command Staff functions in the concept of operations was delayed until 2.5 months after the ConOps implementation for the operational part of the organization. Therefore, Command Staff working relationships and organizational structure will not be discussed in detail in this thesis.

minute to six months. This level is responsible for the day-to-day operations and project execution of programs within the facility.

Level 2, the Tactical Level, is comprised of Project Area Leaders and Competency Center Management Teams and is focused on a middle horizon of six months to two years. Level 2 supervision is responsible for management of the future, resource management, and systems improvement.

The far horizon, Level 3 (the Strategic Level), is focused on by a management team that consists of a core team of senior executives who set strategy and policy for balancing supply and demand as well as any other senior executives to whom the core team will look for advice and help. At the Center, this consists of the collective group of level three managers (the three Directorate Directors and the Project Office Leader), their associates and their staff from the Directorates and Project office¹⁶.

These three levels are supported and integrated by the Command Level (the CO, ED, and XO) who must work to unite the key functional managers in a single vision and direction. The Command Level leads and integrates strategic planning and

¹⁶collectively referred to as the Avionics Group Operations (AGO). The AGO provides leadership and vision. They are responsible for formulating policy that considers the environment external to the Center. (Source: Transition Plan, 1992). After the stand-up of the concept of operations for the Command Staff, this group was expanded to include the directors of these support activities.

uses measurements to ensure group success. These leaders provide a focal point for constancy of purpose and stable course as well as the vision and leadership necessary to balance the resource/process emphasis of the Directorates with the product/customer emphasis of the Project Office. The Command Level also aligns future orientation opportunities between products and technologies or processes.

b. Command Staff

The focus of the Command Staff is quite different from the focus of the Project Office and Directorates. The Command Staff contributes indirectly to meeting external customer needs by meeting the requirements of customers internal to the NAWC-ADI organization; the resources, tools, and services they provide support customers and the organization (designing and maintaining a facility-wide database, for example). These corporate level support functions as well as functions governed by regulatory conditions were divided into six competency areas:

- Infrastructure, Health & Safety, and Security Support
- Group Planning
- Group Communications
- Group Ethics
- Human Resources
- Financial Management and Business Services

While the broad responsibilities and functions of the Command Staff were outlined by the Concept of Operations group that is the subject of this thesis, detailed planning for the integration of the Command Staff functions at the Center did not take place until shortly after commencing implementation of the operational portion of the reorganization. Splitting the implementation of the new Concept of Operations in this manner was deemed necessary to balance the mandate to meet the April 15, 1992 deadline to stand up the new organization with the requirement to properly address all the necessary details of implementation. A six member team led by the XO began developing the strategy for implementing the Command Staff shortly after April 15, 1992 and Command Staff implementation commenced June 29, 1992.¹⁷

c. Project Office

The Project Office manages the external demand upon NAWC-ADI. All work coming to NAWC-ADI comes into and is managed by the Project Office. The Project Office represents NAWC-ADI to external customers and works to satisfy their cost, schedule and performance needs. The Project Office must develop, standardize, implement, and improve the processes for project management, business development, and development of people's project management skills. The Project Office is

¹⁷A detailed discussion of the Command Staff reorganization effort is beyond the scope of this thesis.

responsible for the execution of work using teams. The Project Office is led by a Level 3 Project Office Director responsible for providing a product/customer policy focus as well as planning and predicting future products and customers. He or she also must manage the workload of the facility, oversee programs, delivery of products and services, and establish success measures.

The Project Office uses specialized Level 3 Associates to develop people and train leaders capable of supporting the customer. They also have associates who specialize in improving processes and developing future technologies.

(1) *Project Directors.* Project management is product-oriented. The Project Office is divided into six Product Areas which are headed by Project Directors. Project Directors (Level 3) are responsible for marketing to support workload goals and overseeing proposals as well as for customer requirements planning. They are also responsible for managing Project Leaders for their specified Product Area. The six Product Areas are:

- Core/Common Avionics
- Mission Avionics Electronic Systems
- Platforms
- Weapon Avionics

- Advanced and Integrated Avionics
- Commercial Military Integration

(2) *Product Area Leaders.* Each product area is further classified by equipment type into areas which are headed by Level 2 Product Area Leaders (PALs) responsible for groups of projects.

Targeting new business opportunities is addressed by designating PALs who are responsible for acquiring new work for the Center. Workload goals in repeat and new business areas are assigned to ensure the Center's workload is properly managed.

(3) *Project Leaders.* Project Teams are assigned a Project Leader (PL) that serves as the day-to-day technical manager and primary customer interface for the project. The PL manages the work designed to satisfy customer needs and serves as the Level 1 team leader.

(4) *Project Teams.* Nearly all work at the Center is performed by teams. Project Teams are groups of workers with skills relevant to a particular project's demands who are temporarily assembled into a team. Each project team is custom made to meet the needs of the particular project. Team members are assigned to projects for the duration of the project or until a team member's competency is no longer required. At that time the team member returns to his or her

competency center to be made available for the next project that requires his or her knowledge, skills or abilities. The competency center remains accountable for developing the skills of members assigned to teams, for improvement of competency based processes, and for general administrative and supervisory responsibilities.

d. Directorates

The competency centers are organized into directorates which represent the largest functional element in the NAWC-ADI organization. They are responsible for broader functional areas than the old departments, but have a more defined internal focus on the development and use of resource capabilities. The directorate Directors are responsible for providing resource and process policy focus, planning and predicting to pursue future technologies and processes, future resource needs assessment and development, future business position in DoD and the Navy, ensuring efficient processes and systems and effective use of facilities and equipment, resource development and process improvement, and establishing success measures. There are currently three directorates:

●Alpha: Avionic/Electronic Systems Design (Responsible for turning ideas into designs).

●Beta: Avionic/Electronic Systems Acquisition and Manufacturing (Responsible for turning designs into products).

●Gamma: Avionic/Electronic Systems Fleet Support
(Responsible for translating user needs into product requirements).

(1) *Competency Centers.* Each Directorate is divided into six to ten competency centers. Competency Centers contain all of the personnel having the skills needed to perform the function of the Competency Center. Competency Center personnel may be assigned to project teams which require their expertise or they may remain in the Competency Center to execute work which may support a number of projects (e.g. assembly, environmental testing, welding, etc.).

(2) *Competency Center Management Team.* Each Competency Center is led by a management team (CCMT) consisting of a Director and Associates. Competency Center Directors are responsible for supporting the human resources in their competency by developing their skill levels and improving the processes required to perform the competency center's function. The Associates specialize in people development, process improvement, and scheduling (matching available personnel with project requirements).

(3) *Customer Support Teams.* Customer Support Teams (CSTs) are self managed/directed work teams. There are two types, capacity and process improvement CSTs. Capacity CSTs perform work that is required by Project Teams, but remain within their competency to perform the work. CSTs are given a continuous batch of jobs to perform for the entire

organization; their functions are repetitive and are not cost effective to be given over to the Project Teams (Houghlan, 1993). Process Improvement CSTs focus on improving competency processes.

8. Concept of Operations Approval

The model described above as well as the working relationships, roles and corresponding responsibilities for the new organization was reported to the Commanding Officer and Executive Director by the ConOps team five days ahead of deadline, January 10, 1992. On January 15, 1992, the concept and structure were officially approved by the Commanding Officer. One of the mentors from the Steering team commented on how this approval was a pivotal moment for the Center:

Our culture [used to be that] (1) those teams like that rarely ever finish[ed] on time [and] (2) we almost never accept[ed] what they [brought] us! That meeting was the easiest meeting we ever had in the whole process because they had been brought along on it It clearly blew people away that (1) we met a deadline ... and (2) it blew the team away that it was accepted and we went forward with it.

Directors for the newly-established project office and the directorates, known only as Alpha, Beta, and Gamma at the time, were named shortly thereafter and implementation teams were chartered to determine the way transition would occur. The Concept of Operations Team operated for the next three months as advisors and communicators of the new concept, providing documentation to executive leaders and briefing almost every one of the over 3400 employees within six days.

9. Implementation Planning

Prior to the ConOps team planning effort, the ED had asked other senior managers to begin to sort out the roles and responsibilities of the research, engineering, and plans and programs organizations at the Center. Over the years, the lines had blurred between these three organizations. After these were sorted out, the manufacturing and quality organizations did the same. Many of the Optimal Whats provided to the ConOps team had their roots in these activities (previously discussed in "Department Roles and Responsibilities Review" of the CIC, p. 28). In addition, the review of department roles and responsibilities laid the groundwork for the implementation of the Concept of Operations required by the newly appointed directors of Alpha, Gamma, Beta and the Project office.

a. Implementation Coordination Team

After completing their task, the members of the ConOps team were temporarily in limbo. They had designed themselves out the old organization and the new organization was not yet ready to move into. But an enormous task lay ahead in communicating to the Center the Concepts that they had developed. Therefore, ConOps team members were used to clarify ideas and assist in designing the implementation plan that was to be executed April 15, 1992. They were re-labelled the Implementation Coordination Team (ICT).

b. Communications Efforts

Part of the implementation effort required communicating the new Concept of Operations to everyone at the Center. A team of eight, the CO along with four members of the original ConOps team and three others formed the Communication Team. Two members working on MPA degrees at the time provided a concept from their studies for an organized communication approach. It involved five basic questions:

- Who needs to understand?
- What needs to be communicated?
- How should it be communicated?
- Who is responsible for communicating it?
- What is the timetable for communicating it?¹⁸

The primary audience was non-managerial personnel that needed to understand why the change was occurring. In addition to pamphlets, articles in the Center's newsletter and informal word of mouth, the dominant form of communicating the change was to brief all the employees of the Center in small groups (not larger than 30). These briefings were conducted by the original members of the ConOps team and they were all completed before April 15, 1992.

¹⁸This set of questions was also used later to design a communication matrix to maintain an appropriate flow of information throughout the organization when it was determined the traditional "top-down" mechanisms were not longer adequate or appropriate.

The hour and a half briefings began with a videotape of the CO describing the change and committing the Center to the new Concept of Operations. This was followed by a slide presentation with handouts with anticipated questions and answers. The group was then divided into smaller groups of five or six people each and asked to write on index cards their group's two most important concerns. After a mid-brief break, the questions were discussed in an informal manner.

Many questions could not be answered immediately because the processes had yet to be developed, or reinvented. (For instance, "Who signs my evaluation?") But the individuals who conducted the briefs felt they communicated the change very effectively. There were new concepts and ways of thinking about working that needed to be communicated. The ED noted that

A point was made of using language and a set of terms that were so different that it helped to avoid old paradigms so that they would be forced listen and conceptualize.

c. Implementation Steering Team

After the ConOps team met their deadline, the task of implementation was returned to a group of senior managers, most of whom had performed the initial clarification of departments' roles and responsibilities. Two members of the ConOps Steering team were assigned to the Implementation Steering Team (IST) as well as two other senior managers. They were assigned as the leaders of the Alpha, Beta, Gamma

and Project Office components of the new organization and came to be known as the Avionics Group Operations (AGO). The AGO moved into one member's office (later coined the "war room") at the end of January and began feverish efforts planning the implementation of the new organization which was to be launched April 15, 1992.

Two major changes were represented in the new concept of operations. First, there would be many fewer functional distinctions defining the structure of the organization. And second, project management would be a responsibility distinctly separate from the development and administration of the human resource and process capabilities necessary to complete projects. One member of the ConOps Steering team who ultimately became a Director on the Implementation Team summarized it as follows:

[The ConOps team] basically were getting down to a concept where there were going to be two or three, what we call, directorates in the AGO today. And that was considerably foreign to anything that we had prior to that. ... And then the other thing was the issue that we were going to take ... program management and put all of it in one spot and put all of the people and processes used on the competency side, clearly split [away from program management].

Implementation teams were set up for each directorate and the project office. They were given the overall task of determining how the new concept of operations would develop a flexible, responsive, focused organization and work force. A transition plan was put in place to facilitate the changes needed to move from the hierarchial, controlling

organization to one empowering people to meet its goals.

Since the reorganization mainly affected the managerial structure, the implementation effort focused mostly on defining roles, responsibilities, and working relationships amongst Level 3 and Level 2 managers. Seven to ten person teams were established for the Command Staff, Alpha, Beta, Gamma, and Project Office. A Support Team was established as well as four Continuous Improvement Action Teams (CIATS) to address implementation issues in four main areas: (1) personnel issues (2) financial management (3) information management and (4) negotiation methodology.¹⁹ But time ran out as the deadline approached and Level 1 implementation efforts were never fully commenced. Nonetheless, on April 15, 1992 all of the employees were greeted at the entrances by management welcoming them and distributing information about where they worked, who they worked for and what their position was in the new organization. This was a radical attempt step toward changing the way the organization operated. NAWC-ADI had, figuratively, thrown out the chairs and created an organization that allowed people to approach problems as teams of players with varying abilities and common goals rather than as competing units vying for resources and projects.

¹⁹Source: NAWC-ADI Transition Plan Chart revised March 5, 1992

IV. ANALYSIS

The focus of this research has been to gather and assemble data relating to planning change; specifically, the transition of NAWC-ADI from a traditional, vertically oriented and functionally structured organization to one that depends upon a horizontal, matrix, team-based concept of operation. It must be recognized that the following analysis is but one rendering of the array of data collected from interviews, documents and direct observation of the organizational changes at NAWC-ADI that are documented in this case study. Glaser and Strauss (1967) point out the continual mixing of concepts and ideas that occurs in qualitative analysis:

Constantly redesigning the analysis is a well-known normal tendency in qualitative research (no matter what the approach to analysis), which occurs throughout the whole research experience from initial data collection through coding to final analysis and writing. (p. 101)

This analysis of this organizational change planning will discuss a few striking similarities between conditions and events that have occurred at NAWC-ADI and recently identified trends in American business. Next, the conceptualization and planning of organizational change at NAWC-ADI will be examined and compared with a transition model presented by Beckhard and Harris (1977). Finally, the future of change at NAWC-ADI will be discussed in the context of ideas presented by Senge (1990a).

A. TODAY'S ENVIRONMENT

The challenge of change is an enormous task facing American business today. The modern business world is experiencing the most rapid technological revolution²⁰ in the history of civilization, and NAWC-ADI is not immune to its effects. As a Defense Business Operations Fund (DBOF) activity, NAWC-ADI is one of the few U.S. government organizations whose ultimate survival depends upon their capable response to this post-industrial environment, just as it does for American business. It is within this context that the changes at NAWC-ADI will be analyzed.

1. The Technology Revolution

The technology revolution has provided American business the ability to do what it has always done much, much faster. At NAWC, a team was put together to try to accelerate the time it took to get estimates to their sponsors (customers). It was averaging 140 days; they got it down to less than 30. In addition to speeding up business processes, the quantum leaps in computing now provide a wide flow of data that fuels an enormous and growing need for information. It is possible to obtain valuable data from which information can be derived and learning can take place.

²⁰Referred to also as the information age, post-industrial society, or even "New Age" (Vaill, 1989)

Social and technological structures are being tested and redesigned to accommodate these changes. One of the implementation planning team leaders talked about the need for structural change at NAWC:

We decided that the organization itself, with its vertical chimneys, was so old and calcified ... that we were going to have to do something dramatic if we wanted to build up horizontal communications and processes which is the way work, obviously, actually flows around here.

Old ways of doing business are quickly becoming obsolete as the search for efficiency and innovation intensifies. More simply stated, cow paths are no longer just being paved over, they are being examined, redefined and redesigned.

The impact of the technology revolution on today's generation of workers has been to replace or eliminate many occupations. No longer can workers necessarily follow in the traditional occupations of their parents or grandparents. Those occupations may no longer exist for future generations. Even many of today's workers require mid-career training to upgrade their skills and cope with these rapid changes. Peter Drucker (1988) describes the impact of these effects on large businesses:

The typical business will be knowledge-based, an organization composed of specialists who direct and discipline their own performance through organized feedback from colleagues, customers and headquarters. Like a hospital, symphony orchestra, or a university, the new organization will be largely dependent upon the cognitive skills of its workforce. Employment will move away from manual and clerical work and toward "knowledge workers". An information-based organization will evolve that will resist the command and control model that business took from the military a 100 years ago. (p. 3)

This evolution has taken place at NAWC-ADI. There, the workforce of the future has arrived and they have completely overhauled the command and control foundation upon which government bureaucracies have stood for decades. Three thousand engineers, scientists, computer specialists, and skilled technicians at the Center manage and develop an astounding array of technical and highly complex projects and processes. Borrowing from ideas developed in the civilian aerospace industry, they have built a novel system of managing that incorporates innovation and adaptation into its design. The nature of the rapidly changing technological environment in which NAWC-ADI operates demands it.

2. Perpetual Instability

While the advancement of technology defines the pace at which change occurs, the direction of change is as uncertain as the consequence of change. Peter Vaill (1989) asserts that the rapidity and diversity of change will create an environment of perpetual instability. He describes this "permanent white water" as

... the dynamism, fluidity, extraordinary complexity and fundamental personalness of all organizational action in systems that are *unstable at every point*. (p. xiv)

NAWC-ADI provides a vivid example of how their cadre of knowledge-based specialists combined the concepts of resisting the command and control model and dealing with the permanent white water in their industry. Two self-managing teams were established to study and make recommendations

concerning non-standard parts and micro-circuit obsolescence. These teams directed their own activities to study the impact of rapid technological advances in micro-circuitry that render older micro-circuit designs obsolete. Based in part on the success of these two teams, the self-managing team model has been expanded as an overall organizational tool to allow flexible response and process improvements to meet the rapidly changing environmental requirements and expectations.

3. Managerial Challenges

Not all work in today's organization can be adequately addressed by self-managed work teams, however. Indeed, today's business environment presents a managerial paradox. Vaill notes that the very concept of somehow controlling what is less and less controllable given the rapidity with which knowledge is advancing and change is occurring is difficult if not impossible to achieve. He states,

The 'Grand Paradox of Management' ... in the modern world is to take responsibility for controlling what is less and less controllable. As the world becomes less stable and predictable, the paradox intensifies. Strategically, it is resolved by declaring that today's executives must be *leaders*. The precedence of leadership over management has never been more imperative than it is today.

Without this leadership, transition can be a mucky, misguided event. Or as one less optimistic ConOps team member described it:

Transition means that there are some people who do it real well, others who do it God-awfully. So in that way it tends to work.

4. Organizational Structure

In the foreword to *Matrix* (Davis & Lawrence, 1977), former Citicorp chairman, Walter B. Wriston quotes sociologist Daniel Bell's observation that "... the church and army have been the historic models for organizational life." (p. v) The business corporation "... was the one new social invention to be added to these historic forms" in the 20th century. Wriston asserts that this new social invention provided Western civilization with unprecedented and continuous increases in human productivity by "organizing and controlling the machines, energy, and people" of the industrial revolution. The traditional business structure, however, is heavily derived from the historic military model (the notions of *line* and *staff* for example as well as the scalar principle of power and status increasing at higher levels in the hierarchy) and is not always the universal "one best way" to organize. Nonetheless, it

... has dominated our thinking about organizational structure since the turn of the century. ... A variety of failures, however, has made it clear that organizations differ Structure should reflect the organization's situation--for example, its age, size, type of productions system, **the extent to which its environment is complex and dynamic** [emphasis added]. (Mintzberg, 1992, p. 156-157)

B. REDEFINING THE STRUCTURE

Redefining the managerial and operational structure is the challenge NAWC-ADI faced in the Fall of 1991. They needed to conceptualize and plan their organizational change in a compressed, six-month, time frame in order to implement a new

vision for the organization before new leadership arrived. The transition was to be rapid and dramatic.

1. Patterns of Change

Tushman, Newman and Romanelli (1992) discuss rapid and incremental change periods in the evolution of organizations. They identify two distinct patterns in these change periods: patterns of upheaval and of convergence.

a. Convergence

Managing change in times of convergence requires maintaining equilibrium while implementing incremental changes to fine tune organizational strategy. But the equilibrium the changes are meant to maintain is a double-edged sword. They caution that:

Those very social and technical consistencies which are key sources of success may also be the seeds of failure if environments change. The longer the convergent periods, the greater these internal forces for stability. (p.415)

NAWC-ADI had made incremental changes toward quality improvement throughout the 1970s and early 1980s. But as the 1980's drew to a close, the leadership sensed radical changes in their environment. The fall of the Berlin Wall, the declining DoD budgets, and in turn the shift of government resources from the Cold War military to domestic programs put NAWC-ADI's survival under the scrutiny of the Base Realignment and Closure (BRAC) process.

b. Upheaval

These upheaving forces required frame breaking change driven by a new strategy--to focus on the customer. As one ConOps Steering team member put it, "we needed to restructure in order to make it easier to say yes to the customer". What was needed was a revolutionary change of the system as opposed to incremental changes in the system. One strategy for navigating this transition is provided by Beckhard and Harris' (1977) *Organizational Transitions: Managing Complex Change*.

2. Managing Complex Change

Beckhard and Harris observe that the key to initiating and sustaining change over time is 'transition management', a stage or process used to help organization leaders focus on developing planning processes for coping with the organization and its environment and developing methods for designing and managing new organizational structures. It is therefore useful to examine the conceptualization and planning of organizational change at NAWC-ADI using the transition model presented by Beckhard and Harris (1977).

In discussing the demanding world of the manager, Beckhard and Harris foreshadow the permanent white water of which Vaill speaks.

Today, and likely more so in the future, 'best choice' selection will represent complex dilemmas in priorities and problem solving. (p. 2)

The managerial decisions that will have to be made in the future will be shaped by less clear cut, more diverse standards of what is "best" and whom it is best for.

They also note the changing character of organizational development responsibilities of the manager and provide specific guidance to executive managers about providing the type of leadership that Vaill calls for.

It is increasingly necessary in today's complex organizations to have a planned, managed-from-the-top, organization-wide effort to create a set of conditions and a state that will allow the organization to 'creatively' cope with the changing outside demands on it and that can also increase the possibility of organizational survival.... The executive manager needs knowledge, skills and technology as never before to help in (1) understanding the present state of affairs in the organization, (2) developing relatively clear goals of where he or she wants the organization to get to in the intermediate future, (3) producing a fairly clear picture of a desired state to be achieved by some specified time, and (4) specifying a clear picture of the state which must exist during the interim... the *transition state*. (p.4)

3. Aspects of Complex Change

Beckhard and Harris identify the following aspects of the change process in large complex institutional systems:

1. Diagnosing the present condition, including the need for change;
2. Setting goals and defining the new state or condition after the change;
3. Defining the transition state between the present and the future;
4. Developing strategies and action plans for managing the transition;

5. Evaluating the change effort;
6. Stabilizing the new condition and establishing a balance between stability and flexibility. (p. 16)

These aspects will be used to discuss the change process at NAWC-ADI.

a. Diagnosing the Present Condition

NAWC-ADI found the Leverage process to be their power tool in defining their present (and the future desired) state. The work prior to the efforts of the ConOps team had defined the current state of the organization to be one in which work flowed horizontally, but whose organizational structure had been vertical. That was a basic incompatibility. Another was that project management was disjointed and nonstandard.

The change strategy at NAWC-ADI was therefore focused on what Beckhard and Harris describe as the "fundamental conditions needing change". By asking *why* problems were occurring, after determining *what* problems were occurring, the likelihood of success of their change strategy was increased. They weren't just treating the symptoms but were getting to the fundamental conditions needing to be changed.

In addition to looking at the fundamental conditions for change, Beckhard and Harris recommend an early diagnosis of each subsystem's readiness and capability for

change in developing a successful change strategy. They use a simple formula developed by David Gleicher to evaluate the "cost" of change in each subsystem. The Gleicher formula for determining this cost is:

$$C = (ABD) > X$$

where C = change, A = level of dissatisfaction with status quo, B = clear desired state, D = practical first steps toward the desired state and X = cost of change. This model is useful in diagnosing the Center's decision to make changes to the managerial structure at NAWC-ADI.

The general sense of frustration with the existing managerial system at NAWC-ADI indicates a relatively high level of dissatisfaction. This level of dissatisfaction was sensed by key individuals, (i.e., the CO and ED) in the organization who were expending large amounts of time and energy "refereeing" conflict between the managers. The source of conflict seemed to be imbedded in the structural and cultural competitiveness between the departments. Several interview subjects mentioned a previous ED who described NAWC-ADI as "22 separate little companies" under one command. This competitiveness had become counterproductive.

There was also a fairly clear vision of the desirable state. An AGO member recalled a vision the ED expressed to the AGO team about how they should operate:

He now tells the stories that ... he went from refereeing between the ten departments ... getting your input and my input and they didn't come close to agreeing ... to [as

and example] the AGO now, ... where they took on that responsibility and he was almost excluded. In fact, anytime he took on an issue, they had developed as a team so effectively that he couldn't take any one of them on because the other three would take [him] on [too]. So it had gone from one extreme in this factory all the way to the other end and he laughs about that; how he created this monster for himself. But that's what he wanted to do, in fact he specifically gave some directions. I'll never forget one of the first things he said was 'before you guys ever start working apart, I want you to work together'....

The multiple effects of dissatisfaction with the existing competitive management structure, a clear vision for a more collaborative structure, and the Leverage process as a tool to mapping out practical initial actions shifted the balance of the Gleicher formula toward change.

Visions of a different way of working were also being developed by the Focus and Element teams and later Continuous Improvement Teams and Continuous Improvement Action Teams. What's noteworthy is that these teams were mostly comprised of managers. Thus, the discussions of "current dissatisfaction", "desired state" and "first steps" were not being addressed at the level of the operational employee. In fact, the message was sent to Level 1 workers that they needed to simply continue to focus on satisfying the customer. As one middle manager put it:

... we kept trying to communicate to them, 'This won't affect you, other than ... you may have a new boss. ... You're going to have the same customer and you're going to have the same job as you had before and it's important to keep satisfying the customer.'

Until things were sorted out for the managers, the Level 2 and Level 3 workers, no action could be developed for Level 1 workers.

b. Defining the Future State

To determine their ideal organization in the future, NAWC-ADI focused on resolving the conflicts they had between work which flowed horizontally and their vertical decision-making and communication management structure. That basic incompatibility, as well as the haphazard, disjointed and nonstandard project management necessitated a flatter, project team oriented organization with a sharp focus on satisfying the customer in the future state.

(1) *Why matrix?*²¹ Although the ConOps team considered several alternative organizational structures, they felt that the matrix structure most closely suited their type of operations and their vision for the future. Davis and Lawrence assert that the matrix structure is the preferred structural choice when three basic conditions simultaneously exist: (1) outside pressure for a dual focus, (2) pressures for high-information processing capacity and (3) pressures for shared resources.

Outside pressure for a dual focus usually runs counter to the initial reasons that organizations form. The

²¹The following discussion of the matrix organization relies heavily upon the ideas presented in *Matrix* (Davis and Lawrence, 1977, pp. 1-24).

value of organizations is to handle tasks that are "too big" for an individual. "Too big" can be in terms of physical capacity, (like the inability to be in two places at one time) which can result in geographical dispersion of an organization or some other way to physically handle the capacity of the task. "Too big" can also be defined in terms of the limited mental capacity of an individual, since one person cannot be expert and skilled in everything.

The structure of NAWC-ADI prior to reorganization was based on a natural division of labor by technical specialties. The strength of division of labor along functional lines is that it orients each department to one technical specialty and focuses energy accordingly. Its weakness is that it can provide for the advance of technical proficiency at the expense of providing services and products tailored to the special needs of customers. Attention to the unique project requirements of the customer is a compelling and essential element of survival at NAWC-ADI. As one manager at the Center described it:

... the old organization just seemed too hard... we had a lot of internal conflict, historically, over program management. The department I had, had about 30 program managers and [there were] twice as many as that distributed through [other] departments. So everybody was doing program management. Everybody was doing it differently... But then... this team of mid-level managers... worked [to define the new] Concept of Operations, which I think was an evolution. It was very dramatic in the sense of what it changes organizationally, but we were evolving toward ... [more systematic] project management. It just took us a lot farther, a lot faster

along the road that we had been thinking about going down."

So *project management* became as important an operating consideration as technical competency at NAWC-ADI. Balancing these two considerations was considered essential to their survival and prosperity as it was to the aerospace industry from which matrix management began. As Davis and Lawrence explain:

To survive and prosper in the aerospace industry, any firm needs to focus intense attention both on complex technical issues and on the unique project requirements of the customer. These companies cannot afford to give a second-level status to either the functional groupings around technical specialties or to the project groupings around unique customer needs. They need to create a balance of power between project-oriented managers and the managers of the engineering and scientific specialists. Neither can be allowed to, arbitrarily, overrule the other. Both orientations need to be brought to bear in a simultaneous fashion on a host of trade-off decisions **involving schedules, costs, and product quality** [emphasis added]. The needed behavior is epitomized by a picture of two middle managers with equal power, but at very different orientations and goals, sitting down to debate and argue over each and every point in their search for the answers that would optimize decisions for both technical excellence and unique customer requirements. The dual command structure of a matrix serves to induce this kind of simultaneous decision-making behavior. It was to induce this kind of behavior that matrix was developed. (p.13)

Another condition is pressure for high information processing capacity. There are three contributors to the information processing load: (1) uncertainty--the demands placed on an organization are changing and relatively unpredictable, (2) complexity--the products or services produced by an organization are diversified with complex

organizational tasks, and (3) interdependence--the tasks are highly interrelated. In the 50 years of NAWC-ADI's existence, they had evolved from an organization that manufactured large orders of a small line of products, (originally starting with only the Norden bombsight) to one that produced small numbers of a vast array of diverse products and services. The unpredictability and complexity of the projects they managed was massive. High information processing needs definitely existed.

Conflict over resources is the final condition that indicates a need for a matrix design. Davis and Lawrence define it as

...the condition of the organization being under considerable pressure to achieve economies of scale ... and high performance in terms of both costs and benefits by fully utilizing scarce human resources and by meeting high quality standards. (p.17)

A former branch manager discussed the competition between managers for resources before the reorganization at NAWC-ADI.

They weren't enemies, but they weren't partners. ... They didn't work together to a common goal. ... One might try to "get their resources from another. ... It was all political work.

In addition, conflict external to NAWC-ADI was growing as the defense budget dwindled and competition to survive the BRAC process intensified.

The matrix organizational model is a sharp break from a traditional "one-boss" command structure. The matrix is most useful when it is determined that a pluralistic

model is the best way to coordinate people, materials and money for the production of goods or services; to provide customers what they want at the least cost with the best return on capital invested. These were determined to be the conditions that necessitated the transition that began with earnest at NAWC-ADI in October 1991.

c. Defining the Transition State

The period for making the transition from a vertical, functionally divided organization to a horizontally, team-based organization was fairly clearly defined. The beginnings of it were well underway in October 1991 and the conclusion point was set at April 15, 1992. The decision to stand up the new organization April 15, 1992 took into consideration the approaching departure of the CO in the summer of 1992. It was determined that the complexity of issues that would result from implementation of such a plan would require the experience, support and direction of senior leadership familiar with the existing managerial structure as well as the processes that led to the decision to reorganize. Experience with novel concepts, such as Leverage process would enhance effective leadership of this transition.

But the CO's departure was not the only reason for the sense of urgency; the environment demanded change. As one senior manager stated:

We cannot guarantee that what we're doing will keep us in business. There's not a guarantee in this environment.

We know one thing for sure. We know we can close the doors. We could--not satisfy our customers ... be slow ... be costly ... give people poor performance ... whatever. We clearly could do things that allowed the closure of our doors. **We're making a move to try to make certain we have the highest probability of staying in business.** Typically, that was the "why" part of what we were doing.

d. Developing Transition Strategy

Beckhard and Harris identify three major concepts (1) defining mechanisms for how the change will be managed, (2) developing a process activity plan that specifies actions to be taken in effecting the change and (3) identifying individuals whose commitment is critical and developing a strategy for gaining commitment from those key members.

At NAWC-ADI, mechanisms for how the change would be managed were defined by the command leadership. Selected managers were grouped together to develop, communicate, and implement the change. The ConOps team, ConOps Steering team, Implementation Steering team and Implementation Coordination teams as well as all the sub-teams developed from them were all examples of these mechanisms for change.

NAWC-ADI depended upon the Leverage process to develop a process activity plan and to specify actions to be taken for the planning and implementation. Brainstorming among team members as to what needed to be accomplished and asking simple questions to develop activities toward accomplishing those activities was part of that process. One member of the Implementation Steering team recalled the

seemingly overwhelming planning issues they faced after the hand off from the ConOps team:

You know, people would come to you and they'd go, ... 'What about a phone book?' Oh my God, I have to think of that too? or 'Well how do the codes match into the aircraft division?'. Oh my God, you know. 'What kind of training are we going to do and when and what are we going to tell people about that?' you know? I don't think operationally there were really any brick walls that we ran into. We had a lot of hard points, very difficult points, you know. Most of which involved talking to people

Developing activity lists and "plan as you go" was the tone of operations during the implementation phase. One member of the Implementation Steering team summarized what it was like during this phase:

We undertook a major organizational change and we knew we didn't have it all figured out when we launched. Our plan was to modify as we went. ... We just talked to people ... twelve hours a day, that's all we did. Met with every [implementation planning] group all the time because everybody needed that. They were learning things and we were learning things and we didn't have a lot of time and the Level 2s were kind of unsure of their job. So as they were figuring it out, they weren't helping the Level 1s as much as they would have liked to be helped. So, it kind of compounded itself. ... But on the other hand, I guess we did enough so that we got through it. ... we did go back and set up a Level 1 team to go back and look at that. ... In theory you would have had all your processes understood. You would have everybody trained in their new job ... before you launched. Practically speaking, you're never going to get that done.

This statement reflects the dynamic and chaotic nature of implementing change once a plan for change is chosen. As more than one interview subject noted, "the devil is in the details".

Choosing mid-level managers was critical to successfully gaining commitment to sustain change. Using the senior level managers on the ConOps Steering team as the liaison helped to gain commitment from those not intimately involved in the design process.

e. Evaluation and Stabilization of the Change Effort

These phases of the reorganization are currently underway at NAWC-ADI. There is a concerted effort to have members of the original ConOps team compare how the organization currently is implementing the concept of operations with how the ConOps team had originally intended or expected. This is an attempt to get a sense of where the actual organization is similar or different from the original vision of the ideal organization, then to evaluate the differences and similarities for the value that they add to the organization and make decisions about whether or not to continue or modify them.

Beckhard and Harris provide insight into the post-change climate and the challenges that present themselves in preventing reversion to the pre-change, old ways of operating.

It is a common experience to see a team work together day and night to create a new plant with new working conditions and increased quality of life. ... Six months or a year later, the excitement is over, the operation is routine. ... The attention and energy establishing the new situation are now placed elsewhere. ... There is a dilemma here. One wishes to reduce the ambiguity and confusion that existed during the 'getting from here to

there' state. Concurrently, however, energy can be fully mobilized only if conscious attention is given to a continuous process of checking 'how we are doing'. (p.102)

One difficulty has been that the ideas and concepts fleshed out for NAWC-ADI has caught the attention of other organizations external to the Center. Soon after the stand-up of the new NAWC-ADI much of the talent used to develop and implement the changes at NAWC-ADI was drained off to begin parallel changes at the level of the overall NAWC organization. This has left a post-change leadership vacuum that has been difficult to fill. The ED described it this way:

Pretty soon most of Level 3 was pulled out. The CO rotated The original visionaries who could support and nurture weren't there. ... I felt we had done a disservice to the organization without the people in place to nurture the changes.

Another senior manager described the impact on the organization of having much of the senior leadership off-site for extensive periods. In their absence, employees, whether supporters or skeptics, sensed a void in terms of direction, clarity, and energy from the top:

People were hungry for it and we didn't feed them. ... Many jobs were filled by 'actings' and that sends a signal that you're not sure you're really going to go in that direction.

The ED concluded:

We created a vacuum but we weren't here to fill it. Now we're trying to re-create that vacuum; recreate that momentum. It will never be as big an opportunity as before.

The ability to reflect upon NAWC-ADI's situation (as expressed by the ED and manager just quoted above and a great many of the other managers interviewed for this study) is an indication of the strategic kind of thinking that is called for in a learning organization.

4. The Learning Organization²²

The fundamental challenge that confronts NAWC-ADI is not unlike the challenge that confronts most of American business; it is to find a way to build an organization in which continuous improvement can occur. The key link to "building in" continuous improvement is to build in continuous learning. An organization that can accomplish that can accomplish a great deal and continue to accomplish a great deal more.

a. Leadership

Peter F. Senge (1990c) provides valuable insight into the kind of fresh perspective that leaders of learning organizations must have to build continuous learning into organizations. He writes:

In an increasingly dynamic, interdependent, and unpredictable world, it is simply no longer possible for anyone to 'figure it all out at the top.' The old model, 'the top thinks and the local acts,' must now give way to integrating thinking and acting at all levels. While this challenge is great so is the potential payoff. (p.7)

²²This discussion of learning organizations is based upon ideas presented in Peter F. Senge's book, *The Fifth Discipline; the Art and Practice of the Learning Organization*.

Senge contends that the type of leadership that has existed in the traditional business structure for decades is insufficient to adapt to today's environment.

Leaders in learning organizations are responsible for *building organizations* where people are continually expanding their capabilities to shape their future--that is, leaders are responsible for learning. (1990c, p. 9)

b. Foster Learning

To shape the future, rather than react to the present, leaders of learning organizations must foster learning at all levels in their organization. Senge distinguishes between two types of learning: adaptive and generative learning. Generative learning is about creating, while adaptive learning is about coping. Adaptive learning is about reacting to situations while generative learning goes deeper than desires to respond to unfolding events; generative learning is about expanding capabilities by identifying opportunities for growth.

c. Expanding Capabilities

To expand capabilities, organizational leaders must cultivate workers to think in terms of relationships between, among and within systems. They must tackle difficult problems by focusing on the source of problems, rather than the symptoms they create.

NAWC-ADI has made great strides in this area by implementing a management system that is designed to support the customer. The relationships between the functional areas

of the Center have been streamlined to enhance the support for customers.

d. Individual Vision

NAWC-ADI chose to expand its capabilities to learn by empowering workers to develop solutions and their own visions of where they wanted the organization to go. The team of mid-level managers had to develop a concept of operations independent of the vision that the senior management had for the organization. They were encouraged to think outside the lines.

The initial "false start" was an important learning event where they developed an awareness that the only constraints to their possibilities were the mental assumptions that they had about their bounds. The ConOps team learned to overcome their resistance to making changes to their current reality. They developed an awareness of "what might be" and found their vision of "what could be" more important than their current situation. They were so very focused on seeing their vision of a new system come to be that they completely ignored their own self-interests in designing the new organization.

The Concept of Operations group did not exist in a vacuum nor emerge from the ether, however. There is something unique about NAWC-ADI that allows groups like the ConOps team to develop and contribute to the organization. An environment

rich with patterns of inquiry and exploration exists at the Center. They constantly yearn for new and better ways of performing their mission. There exists command leadership and senior management with the self-confidence to delegate true responsibility for frame breaking changes. They realize that true leadership exists not in the power of position, but in the ability to foster an environment where employees can figure out what needs to be done and do it well. These patterns reach back to at least 30 years ago (with the zero defects initiative), and perhaps further, and have been sustained and galvanized throughout the years. The leadership and management at NAWC-ADI relied upon their confidence in their vision and the integrity of everyone in the organization to do what was best for the organization to bring about these changes.

From this nurturing environment, the Concept of Operations group was able to develop more than new concepts. They developed new ways of aspiring for change. They were able to channel their "creative tension" (the tension that is developed from analyzing the difference between the present state and the future state) into achieving their future state. Like a glass half empty or half full, they strove to fill their glass, to fill in the unknown; not to avoid emptiness, but to achieve fullness. Generative learning concentrates on achieving that fullness, by encouraging members of an organization to develop their own version of the future, or

vision state, and then working to achieve it. Generative learning does not focus on "getting the right strategy", it focuses on "fostering strategic thinking".

NAWC-ADI must continue to develop their ability to channel their energy for change into aspiring for positive visions rather than avoiding negative realities of the present. They must sharpen their ability to define their present realities and be able to question their own assumptions. They must be allowed to continue to focus on not just particular events or behaviors, but to focus their attention on the systems that define the relationships between the various components of their work. This will allow them to choose key leverage points within these systems at which their energies should converge.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

This inquiry into the reorganization at NAWC-ADI began with an examination of the historical factors that led to the sweeping restructuring of work and working relationships at the Center. It highlighted several attempts at improving quality, among them, the PRIDE (Personal Responsibility In Daily Effort) and CAPS (Creative Approach to Problem Solving) programs. It discussed the coalescing of ideas for change with the development of specific actions toward continuous improvement. These actions followed extensive training in Total Quality Management that included sessions by Dr. W. Edwards Deming himself. This series of improvement efforts culminated, prior to the reorganization, in the development of the Center's Vision, Values, Goals and Strategies and the designation of the CIC (Continuous Improvement Council) as the senior management group charged with their implementation.

This thesis also examined internal and external factors relevant to the decision to redesign the organizational structure at the Center. Among the external factors were changes in the political environment, including the collapse of the Soviet Union and its effect on U.S. military policy and budgets. A need for improved efficiency, greater flexibility and responsiveness, and an organizational structure more

compatible with the horizontal flow of work at the Center were internal factors that led to a more horizontally oriented management structure.

Next, the processes, activities, dynamics and outcomes of the Concept of Operations team and the Concept of Operations Steering team were discussed. An extensive description was provided of the process the Center formally adopted for moving from present states to ideal states by diagnosing constraints and developing strategies to overcome them. This process, called the Leverage process, facilitated the ConOps team's selection and refinement of the matrix managerial design as a blueprint for the new organizational structure at NAWC-ADI. The efforts to plan the implementation and communication of the concepts of the new organizational design were presented as well.

The data gained from this study were analyzed by comparison with ideas from several writers about the current business climate in America, including notions suggested by Peter Drucker and Peter Vaill. The transition from a hierarchical, functionally defined organization to a matrix, team-based organizational design was compared with a theoretical model for managing complex change presented by Beckhard and Harris. Finally, the significance of NAWC-ADI's transformation was discussed in the context of ideas presented by Peter Senge in his book, *The Fifth Discipline: The Art and Practice of the Learning Organization*.

B. CONCLUSIONS

The information gleaned from a multitude of ideas presented by those interviewed for this study leads to several conclusions:

- Total Quality Management and continuous improvement training must include everyone in the entire organization. It is absolutely essential that support for continuous improvement be by example, not rhetoric.
- Inspire individual leadership by providing exemplary adherence to whatever organizational practices are adopted. "Walk the walk", don't just "talk the talk".
- Dig for knowledge. Educate yourself and others. Seek out scholarly work concerning actions in areas that are being considered. Consult experts and draw upon all available resources to learn from the experiences of others.
- Capitalize on the experience of senior employees by providing training to enhance their mentoring and coaching skills. Then, allow them to nurture, develop, and guide the work of others who are less experienced.
- Acknowledge the historical and organizational context in which change is to take place. At NAWC-ADI ideas and concepts like teamwork, empowerment, horizontal communication, customer focus, and process improvement were important contributors to the steps that they were able to take.
- Implementation issues will consume the majority of time and energy during the transition period. Address implementation details as they emerge with persons closest to the situation as the experts. (But no matter how much time you budget for implementation, it will never seem like there is enough.)
- "Test-marketing" develops support, builds consensus, and improves the clarity of new ideas. It helps to get an accurate picture of the present conditions to better tailor change strategies for reaching a future state.
- Once the decision is made to change, conduct the change throughout the complete organization swiftly. This helps to build on momentum for change that may be diffuse or dissipated if the change process is prolonged.

●Use concept developers throughout the implementation planning and implementation phases to clarify, reaffirm and reconfirm concepts as implementation occurs. After implementation, continue to communicate and educate organizational members. The original concept planners need to be involved in these communication efforts to monitor feedback about where the organization is and compare it to where it wants to be.

●The matrix organizational strategy is a unique managing design for task orientation and people orientation. It is not a universal management structure that can be applied in all cases to all organizations. Its usefulness must be critically evaluated before adopting it.

●Do not be afraid to fail and do not view failure or mistakes as negative experiences. Make failure a learning experience and provide a supportive environment from senior leadership to encourage risk-taking and outer edge thinking to exploit the capabilities and horizons of organizations.

●Respect individuals. Acknowledge the fundamental humanness of organizations including the "softer issues" like anxiety, excitement, anger, integrity, conflict and inspiration. Organizational success, failures and other dynamics are completely dependent upon individual's efforts, abilities, skills, energies and emotions. Pay attention to these and develop skills to balance and harness these valuable commodities into constructive forces.

●The value of swift communication is indispensable. Providing feedback in "real time" allows organizations to make faster, better informed operating decisions. Flatter organizational structures enhance communication flow and provide a greater pool of knowledge about the environment from which to make decisions.

●Harnessing the talents of the new workforce of "thinkers" requires new ideas about organizing and performing work. This requires new evaluation and reward systems.

C. RECOMMENDATIONS

Further research is recommended. The scope of this study was limited to the concept of operations development and implementation for the operational portion of NAWC-ADI. The support function provided to NAWC-ADI by the Command Staff is an equally important and compelling area of research that merits documentation and analysis.

The matrix organizational design is a source of "built-in" conflict between the external focus of the organization toward meeting customer demand and the internal focus of developing workers and allocating talent and resources. Working and managing these conflicting goals deserves further research. Analysis of developing the effectiveness of team-based organizations and self-managed work teams is also required.

Other areas of study include the implementation of competency based organizations at the NAWC Aircraft Division level and further research on reward and evaluation systems for competency based organizations is recommended.

APPENDIX A: INTERVIEW GUIDE

Tape no. _____

Interview Guide

Interviewer(s) Tim Green / Susan Hocevar

Monitor Joe Bauknecht

Interviewee _____

Tel _____

Work Area _____

Best Time to Contact _____

We are interested in writing a case study of how NAWC underwent the major change that has occurred over the past 3-5 years. Most organizations do not undergo such a radical change. There must be something unique about this place, there must have been some unique people and events that made this change possible. We want to hear stories about these things. Very few things have been written on the process that groups and organizations go through. Some of these processes are:

- ☐ the development of visions,
- ☐ the decisions that people consider,
- ☐ the struggles that groups go through,
- ☐ the trouble some people have in believing such a radical change is possible,
- ☐ the excitement and inspiration some people provide, etc.

We want to write this so that in the future, organizations that are going through the change process can learn what it has been like for those organizations that have experiences radical change -both the successes and the difficulties.

For that reason, we have asked to meet with the key players who were involved in the very early stages. We want to hear stories about how this new organization evolved. Particularly, we want to know

- ☐ how new ideas were proposed,
- ☐ who proposed that these changes occur,
- ☐ how people responded,
- ☐ how this culture became concerned with quality

We would like to record this interview in order to help us piece together the history of the reorganization of NAWC. We intend, however, to keep your identity anonymous in order to allow you to be as candid as possible in your remarks and also to make the lessons learned from your experience applicable to other reorganization efforts. Any information you provide us with will be a valuable part of this history.

Questions

If you think back to 3-4 years ago, what was it like for you to work here?

What sort of change would **you** say was needed and what was the most important reason for that change?

Tell me about the first time you heard about ideas for change around here.

How did it get started?

How did you hear about it? From who?

What was your reaction or impressions?

How did you get involved in the process?

What was your role?

Tell me about the team that was put together to develop the ideas for changing NAWC.

How was it formed?

What was your role?

What happened?

What decisions was the team faced with?

What did it accomplish well?

What did it find easy to do?

What did it not do well?

What did it struggle with?

Can you tell me about some decision or event that you are most proud of in your work on the reorganization?

If you had it to do over again, what would you change?

what would you keep the same?

What's the most important lesson you learned from your experience in this process?

How you feel about the way things have turned out?

Are they anything like you hoped they would be?

How are they different?

APPENDIX B: LIST OF ORGANIZATIONAL DOCUMENTS

The following documents provided by NAWC-ADI were used in the development of this case study. Loose documents are arranged in order of presentation in two binders provided by Mr. Dale Lewis at NAWC-ADI. Other bound and miscellaneous documents follow. Each document is described as follows:

Titles (if any) in quotes. Description. Author or source (if known). Date (if known).

Binder 1 (blue)

"Design for the Future". Four-panel pamphlet. Volume 1, No. 2. Published by Implementation Communication Team. Dated April 7, 1992.

"Baldrige Model Briefing". 11 overhead projector slides.

"Total Quality Leadership and Organizational Change". 40 overhead projector slides. Presented by Commander John Langford (XO, NAWC-ADI) at Naval Postgraduate School, Monterey, CA. March 1994.

"Reorganization Lessons Learned". Dated July 1, 1994.

"Naval Air Warfare Center Aircraft Division Indianapolis Reorganization Information: Outline". Outline followed by two pages of text, text begins "Zero Defects at NAFI" author unknown. Undated.

"The Turning Point". Eight page document, text begins with "It start coming together with Deming" author unknown. Undated.

"Reorganization Process". Two page document, text begins with "...quicker response and faster improvements..." author unknown. Undated.

"C. Model". Four page document, text begins with "[The model discussion will be developed..." author unknown. Undated.

"Model Explanation. Two page document, text begins with "[Much of this can come out of the 'Model Explanation' ..." author unknown. Undated.

"NAWC-AD Indianapolis Reorganization Process. Commonly referred to as the "list of six". Undated.

"Level 2 Staff Support". 26 page report, first 17 pages of which appear to be overhead slides. Undated.

"Transition Plan". Dated May 1992.

"Concept of Operations". 69 overhead slides. Presented by Concept of Operations Team to NAWC-ADI employees, January 1992.

Binder 2 (white)

"Reorganization/Implementation Calendar".

"Roles and Responsibilities". 31 Overhead slides. Developed March 1992.

Untitled. Transition Team Planning Chart. Dated March 5, 1992.

"Level 3 Implementation Team Meeting Minutes". Dated February 21, [1992].

"Reorganization Implementation Teams". Team Roster, three-pages.

"Implementation Plan". Dated March 5, 1992.

"In Support of Implementation Planning". Work assignments for Tom Decoster. February 24, 1992.

"Beta Training Needs". Beta Level 2 team. March 24, 1992.

"Training Announcement--Process Measurement: Collecting and Using Data". Undated.

"Training Announcement--Deployment Flowcharting: Team Specific". March 26, 1992.

"Training Announcement--Deployment Flowcharting for Individuals". March 24, 1992.

"Re: Concepts Implementation Planning & Transition Processes: Tom Decoster Roles and Responsibilities". Undated.

"Request, Authorization, Agreement, Certification of Training and Reimbursement-- Course Title: Developing the Communication Matrix". Rough Copy DD Form 1556. Signed February 20, 1992.

"Request, Authorization, Agreement, Certification of Training and Reimbursement-- Course Title: Employee Participation Strategies". Rough Copy DD Form 1556. Signed February 20, 1992.

"Request, Authorization, Agreement, Certification of Training and Reimbursement-- Course Title: Effective Strategies for Dealing with Change". Rough Copy DD Form 1556. Signed February 20, 1992.

"Request, Authorization, Agreement, Certification of Training and Reimbursement-- Course Title: Effective Meetings". Rough Copy DD Form 1556. Signed February 20, 1992.

"Request, Authorization, Agreement, Certification of Training and Reimbursement-- Course Title: Managing Change". Rough Copy DD Form 1556. Signed February 20, 1992.

"Request, Authorization, Agreement, Certification of Training and Reimbursement-- Course Title: Organizational Development". Rough Copy DD Form 1556. Signed November 26, 1991.

"Concepts of Operations Team Members". Roster. Undated.

"Invoice 12054". Letter from London Witte & Company for Consulting Service. December 31, 1991.

"Model". Ten overhead slides. Undated.

"Directorate/Project Office Implementation". Meeting minutes. February 26, 1992.

"Level 2 Implementation Team". Meeting Minutes. February 21, 1992.

"Competency Center: ... Mission: ... ". Worksheet. Undated.

"Reorganization Implementation Teams". Three page roster. Undated.

"Command Staff Update #1 (Handshake #1)". Seven overhead slides. Undated.

"POA&M to Stand Up the Command Staff". Covers March 6 to March 30, [1992].

"Command Staff Implementation". Memorandum from XO, NAWC-ADI with enclosure titled "Command Staff Implementation and Concept of Operations Process". Dated March 5, 1992.

"Response to Command Staff Update #1". Notes. Undated.

"Competency Center: Mechanical Design/Electronic Packaging...". Worksheet. March 10, 1992.

"Competency Center: Avionics Systems Engineering/Integration...". Worksheet. Undated.

"Competency Center: Avionics/Electronic Design ...". Worksheet. Undated.

"Competency Center: Product Support Engineering ...". Worksheet. Undated.

"Competency Center: Avionics Software Engineering ...". Worksheet. Undated.

"Project Flow Accountability Map". Five-pages of tables. Dated March 24, 1992.

"Roles and Responsibilities Of A Project Leader". Undated.

"Project Team Concept of Operations". 2 pages. Undated.

"Pipelines Implementation Planning". Letter from Arlene Nickerson, Leverage Company to Level 3 and 2 Implementation Teams. March 13, 1992.

"Actions from 2/7 meeting". Meeting minutes. Undated.

"Stepping through the Concept of Operations: How a Project Flows". Four page document with narrative to flowchart. Undated.

"Resource/Capacity Negotiation, Assignment, Supervision According to the Model/Concept of Operations". Undated.

"Meeting Minutes from IST meeting". Dated February 20, 1992.

"Level 2 Implementation Team". Meeting minutes. Dated February 13, [1992].

"2/7 Meeting Minutes".

"Communications Matrix". Blank worksheet and four pages with worksheet information filled in. Undated.

"Agenda-ICT". Dated March 23, 1992.

"Communication Activities". ICT Agenda. Undated.

Untitled. Rough draft for ICT pamphlet text, two pages.
Undated.

"Concepts of Operations Communications Matrix". Five part
outline. Undated.

"Presentation". ICT presentation guidelines/ideas. Undated.

Untitled. ICT presentation schedules from February 24, 1992 to
March 2, 1992.

"Deployment Flowcharting". 18 page training handout. Undated.

"Business Development...". 22 overhead slides. Undated.

"Directorate Constructs Teams Update". Meeting minutes.
October 15, 1991.

"Notes from Constructs "Concept of Operations" Team meeting on
10/17". Meeting minutes. [October 17, 1991].

"Notes from meeting between Concepts of Operations Team and
[Implementation Steering Team]". Four page agenda, goals,
etc. October 19, 1991.

Miscellaneous Documents

"Beamrider". NAWC-ADI newsletter. December 22, 1993.

"Beamrider". NAWC-ADI newsletter. January 20, 1994.

"Customer Support Teams". Manual. Undated.

"Naval Air Warfare Center Aircraft Division, Indianapolis".
Three-fold white, full color glossy folder. Undated.

"Naval Air Warfare Center Aircraft Division, Indianapolis".
Three-fold full color glossy pamphlet. Undated.

"Naval Air Warfare Center Aircraft Division, Indianapolis:
Celebrating 50 Years of Service to our Nations Defense".
Public affairs handout. Undated.

"Organizational Concept of Operations Manual". June 16, 1992.

"Team Forum". Naval Air Systems Command newsletter.
December, 1993.

Untitled. 16 page public affairs information pamphlet.
Undated.

APPENDIX C: VISION AND VALUES STATEMENT



NAVAL AVIONICS CENTER

CORPORATE VISION AND VALUE STATEMENTS

*Our only reason for existence is to support the Fleet.
In order to maximize the effectiveness of this support,
our vision of the future is . . .*

**THE NAVAL AVIONICS CENTER WILL BE RECOGNIZED
AS THE LEADER IN AVIONICS AND MANUFACTURING EXCELLENCE**

VALUE STATEMENTS

- The Center will foster an environment for continuous improvement in all aspects of its operations.
- Customers are the reason for the Center's existence, therefore customer satisfaction is our highest priority.
- The Center's most important resource is its pool of talented and dedicated personnel. The Center will establish an environment that fosters mutual respect, cooperation and the recognition of the importance of individual contributions to create a strong, effective team.
- This Center's strength is demonstrated in its manufacturing capability. This capability will be emphasized in all our project pursuits.
- The Center shall provide the highest quality, most responsive services and products.
- The Center shall create a working environment that is not only challenging but conducive to growth and innovation and reflects the cultural demographics of the community.
- The Center shall demonstrate its commitment to individual and team innovation by encouraging and recognizing the application of non-classical approaches.
- The Center is committed to exploiting technology to satisfy the needs of the Navy.
- All Center operations shall be characterized by the highest standards of integrity.
- The Center shall provide an environment to enable employees to achieve their maximum potential.
- The Center shall make positive contributions to the community, commensurate with its capabilities as a Corporate resident of Indianapolis.


W. C. COURTNEY
COMMANDING OFFICER


ROBERT J. BARNETT
EXECUTIVE DIRECTOR

APPENDIX D: GOALS AND STRATEGIES



NAVAL AVIONICS CENTER

CONTINUOUS IMPROVEMENT GOALS AND STRATEGIES

PREAMBLE

Recognizing customer satisfaction as our highest priority, and consistent with our vision and values, the following goals and strategies are established to provide focus to our continuous improvement efforts.

GOAL I

NAC will provide world-class response to our customers.

STRATEGIES

1. Continuously reduce the Center's cycle times.
2. Meet or exceed competitive schedule and quality standards in the delivery of products and services.
3. Strengthen the Center's focus on satisfying customers.

GOAL II

NAC will employ business practices that result in value added to our customers.

STRATEGIES

1. Assure the timely and orderly integration of our information technology systems.
2. Support customer information requirements.
3. Improve resource and cost allocation processes to assure that our products and services provide the highest value.

GOAL III

People and environmental values will be an integral part of NAC's business practices.

STRATEGIES

1. Pursue an innovative culture that capitalizes on diversity among people and treats everyone as a respected member of the organization.
2. Work toward eliminating hazardous materials and wastes at NAC.
3. Foster an innovative safety culture.

GOAL IV

NAC will pursue a product focus on avionic and electronic systems in support of its Warfare Center leadership areas and responsibilities.

STRATEGIES

1. Clearly establish NAC's role in the front-end process of advanced and integrated avionics.
2. Seek work opportunities that maintain capabilities in design, manufacturing, manufacturing technology, acquisition and production support.
3. Develop corporate partnerships with Air Warfare Center members and other Warfare Center activities consistent with our leadership areas and our product goals.

1 October 1991

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GLOSSARY

- Aircraft Division (AD) - Component of the Naval Air Warfare Center designated to be the Navy's principal research, development, test, evaluation, engineering, and fleet support activity for Naval aircraft, engines, avionics, aircraft support systems, and ship/shore/air operation. Headquartered in Patuxent River, MD.
- Associates - Personnel reporting to Level 2 or Level 3 managers responsible for personnel development, capacity and resource scheduling, and process improvement.
- Avionics Group Operations (AGO) - The collective group of Level-3 managers, their Associates, and their staff from the Directorates and the Project Office.
- Capacity - Product, service, or knowledge provided to a project team in the form of a completed function.
- Command Level - Leadership and integration of strategic planning provided by the Commanding Officer, the Executive Director and the Executive Officer. This level provides the focal point for constancy of purpose and stable course.
- Command Staff (CS) - Corporate level functions including Corporate planning, legal counsel, public affairs, Communication Center, information resources, human resources, financial support, medical, and security.
- Competency Centers - Sub-elements of the Directorates containing personnel possessing skills unique to the function of the Competency Center.
- Customer - Requester of a product or service.
- Customer Support Team - A sub-group of individuals from a Competency Center working together to complete a total process/job. They are self-managed, self-regulating employees who produce competency center's products or services to meet customers' need/requirements and the goals and responsibilities of the competency center.
- Directorate - That portion of the organization responsible for providing resources and processes necessary to successfully complete a project.

Level 1 - Personnel responsible for operation and execution.
Day-to-day management of the progress of a project provided by the Project Leader.

Level 3 - Personnel responsible for vision and leadership, policy and external environment. Senior-level management provided by the Directorate Leaders and the Project Office Leader and the Project Directors.

Level 2 - Personnel responsible for resource management, systems improvement and competency center management. Mid-level management provided by the Competency Center Directors in the Directorates and by the Product Area Leaders in the Project Office.

Naval Air Warfare Center, Aircraft Division, Indianapolis (NAWC-ADI) - Component of the Aircraft Division responsible for the leadership areas of electronics manufacturing and production support; electronic systems transition to production, and pilot/emergency production. Designated to conduct research, development, engineering, material acquisition, pilot and limited manufacturing, technical evaluation, depot maintenance, and integrated logistics support on assigned aviation electronics (avionics), missile, spaceborne, undersea, and surface weapon systems and related equipment. (Formerly the Naval Avionics Center.)

Naval Air Warfare Center (NAWC) - The Navy's full spectrum research, development, test and evaluation, engineering, and fleet support center for air platforms, autonomous air vehicles, missiles and missile subsystems, weapons systems associated with air warfare, and for sensor systems used to conduct anti-submarine warfare from air platforms. Headquartered in Washington, DC and consisting of Aircraft Division and Weapons Division.

Product Areas - Sub-elements of the Project Office representing major customer areas.

Project Office - That portion of the organization responsible for directing the project management functions, customer satisfaction, and product delivery.

Project Teams - Sub-elements of the Project Office's Product Areas where work is accomplished to satisfy customer requirements.

Resource - Personnel assigned as a member of a Project Team which requires the continuity of the individual's involvement in the project.

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